LOGIC.

TABLE OF CONTENTS.

CHAPTER ONE - INTRODUCTION TO LOGIC. . . . . 1.
Article One - Necessity of Logic. . . . . 1.
Article Two - Character of Logic as science and art. . . . . . 2.
Article Three - Formal object of logic. . . . . 3.
Article four - Certain preliminary notions. . . . . 4.
Article five - Division of Logic. . . . . 9.

BOOK ONE: FIRST PART OF LOGIC: ON PREDICABILITY. . . . . .10.

SECTION ONE - PRE-AMBLES TO THE STUDY OF PREDICABILITY. . . . . 11.

CHAPTER TWO - SIMPLE APPREHENSION WHICH IS THE CAUSE OF PREDICABILITY. . . . . 12.
Article One - Notion of simple apprehension. . . . . 12.
Article Two - By what acts is simple apprehension exercised. . . . . 13.

CHAPTER THREE - THE CONCEPT, WHICH IS THE WORK OF APPREHENSION, IN ITSELF. . . . . 15.
Article One - Formal and objective concept. . . . . .16.
Article Two - The comprehension and extension of a concept. . . . . 19.
Article Three - Determination of the nature of a concept. . . 22.
Article Four - Division of concepts. 24.
Article Five - Relations of concepts to each other. . . . . . . 31.

CHAPTER FOUR - THE SIGN OF THE CONCEPT, or TERM. . .33.
Article One - Necessity of manifesting concepts by sensible vocables. . . . . 34.
Article Two - Sensible vocables as signs of thoughts. . . . 35.
Article Three - The notion of terms. . . . . 37.
Article Four - Division of terms. . . . . 38.
Article Five - The principal property of terms, or supposition. . . . . 44.
Article Six - The other properties of terms. . . . . 49.

SECTION TWO - PREDICABILITY ITSELF IN GENERAL. . . .53.

CHAPTER FIVE - THE NATURE OF THE UNIVERSAL IN ITSELF. . . . . 54.
Article One - Necessity to establish the nature of the universal. . . . . .54.
Article Two - Preliminary observations. . . . . 55.
Article Three - The universal represents the real nature of things. . . . . 58.

Article Four - The universal exists as universal in mind only. .... 60.
Article Five - Nature of predicability. .... 62.

CHAPTER SIX - THE UNIVERSAL CONSIDERED RELATIVELY TO ITS INFERIORS, OR THE DISTINCTION OF METAPHYSICAL DEGREES. .... 64.

Article One - The question. .... 64.
Article Two - No distinction on the part of thing between metaphysical degrees. .... 65.
Article Three - Distinction between metaphysical degrees is of concept, not of name only. .... 67.

SECTION THREE - PREDICABILITY ITSELF IN SPECIAL. ... 72.

SUB-SECTION ONE - UNIVOCAL PREDICABILITY. .... 72.

CHAPTER SEVEN - UNIVOCAL PREDICABILITY IN SIGNIFIED ACT, OR THE PREDICABLES. ....73.

Article One - General division of predicables. ....73.
Article Two - The predicables in special. .... 74.
Article Three - The individual. .... 80.
Article Four - Ordering of the predicables. ....81.

CHAPTER EIGHT - UNIVOCAL PREDICABILITY IN EXERCISED ACT, OR THE PREDICAMENTS. ...83.

Article One - Nature of the predicaments. .... 83.
Article Two - Division of the predicaments. .... 85.

Dissertation One - The ante-predicaments. .... 85.
Dissertation Two - The very division of the predicaments. ... 88.

Article Three - Properties of the predicaments, or the post-predicaments. .... 92.

SUB-SECTION TWO - ANALOGOUS PREDICABILITY. .... 96.

CHAPTER NINE - NATURE OF ANALOGUE. .... 97.

CHAPTER TEN - DIVISION OF ANALOGUES. .... 102.

CHAPTER ELEVEN - SUAREZIAN CONCEPTION OF ANALOGUE COMPARED WITH THAT OF ST. THOMAS. .... 114.

SECTION FOUR - THE SIGN OF THE UNIVERSAL, OR DEFINITION. .... 116.

CHAPTER TWELVE - SPEECH, LOCUTION OR DISCOURSE. . . 117.

CHAPTER THIRTEEN - THE MODES OF KNOWING. . . . . 120.

CHAPTER FOURTEEN - DEFINITION ITSELF. . . . . 121.

Article One - Nature of definition. . . . . 121.
Article Two - Diverse species of definitions. . . . . 122.
Article Three - Laws of definition. 125.
Article Four - Origin of definitions. . . . . 126.
Article Five - Nature of pursuit of definition. . . . . 127.
Article Six - Modes of pursuit of definition. . . . . 128.

CHAPTER FIFTEEN - THE PRINCIPAL INSTRUMENT OF DEFINITION, WHICH IS DIVISION. . . . . 134.

Article One - Whole and part. . . . . 134.
Article Two - Nature of division. 137.
Article Three - Kinds of division. 138.
Article Four - Laws of division. . . . . 142.

BOOK TWO: SECOND PART OF LOGIC: ON PREDICATION. . . . . 143.

SECTION ONE - PREAMBLES TO THE STUDY OF PREDICATION. . . . . 144.

CHAPTER SIXTEEN - JUDGMENT, WHICH IS THE CAUSE OF PREDICATION. . . . . 145.

Article One - Nature of judgment. 145.
Article Two - Properties of judgment. . . . . 150.

CHAPTER SEVENTEEN - THE SIGN OF JUDGMENT, WHICH IS THE PROPOSITION. 150.

Article One - The work of judgment, which is the enunciation. . . . . 151.
Article Two - The proposition, which is the sign of judgment. . . . . 151.
Article Three - Division of propositions. . . . . 152.
Article Four - Properties of propositions. . . . . 160.

Dissertation One - Identity of propositions. . . . . 160.
Dissertation Two - Opposition of propositions. . . . . 162.
Dissertation Three - Equipollence or obversion of propositions. 168.
Dissertation Four - Conversion of propositions. . . . . 169.

SECTION TWO - PREDICATION. . . . . 172.

CHAPTER EIGHTEEN - PREDICATION IN SIGNIFIED ACT. . . . . . . 172.

Article One - Nature of predication. . . . . 173.
Article Two - Modes of predicating 'per se' or of essential predication. . . . . 174.

CHAPTER NINETEEN - PREDICATION IN EXERCISED ACT. . . . . 178.

BOOK THREE: THIRD PART OF LOGIC: ON ILLATION.............. 181.

SECTION ONE - PREAMBLES TO THE STUDY OF ILLATION, OR ON REASONING, WHICH IS THE CAUSE OF ILLATION, AND ITS WORK. .... 182.

CHAPTER TWENTY - NATURE OF REASONING AS IT IS THE ACT OF REASON...................... 183.

CHAPTER TWENTY-ONE - REASONING AS IT IS A WORK OF THE INTELLECT.......................... 186.
- Article One - Nature of reasoning logically considered.. 186.
- Article Two - The laws of reasoning................ 188.

CHAPTER TWENTY-TWO - THE SIGN OF REASONING, OR ARGUMENTATION. .... 189.

SECTION TWO - SYLLOGISM.......................... 190.

CHAPTER TWENTY-THREE - THE CATEGORICAL SYLLOGISM. ...... 191.
- Article One - Notion of categorical syllogism. .... 191.
- Article Two - Principles of the categoric syllogism. .. 192.
- Article Three - Laws of the categorical syllogism...... 195.
- Article Four - Forms of categoric syllogism. .... 200.
- Article Five - Reduction of the moods of the categoric syllogism.................. 212.
- Article Six - Value of the syllogism and of its reduction. 215.
- Article Seven - Quantification of the predicate. .... 221.

CHAPTER TWENTY-FOUR - THE HYPOTHETICAL SYLLOGISM. ..... 225.
- Article One - The hypothetical syllogism in common... 225.
- Article Two - The disjunctive syllogism. .... 226.
- Article Three - The conjunctive syllogism.............. 229.
- Article Four - The conditional syllogism............. 229.

CHAPTER TWENTY-FIVE - OTHER DIVISIONS OF THE SYLLOGISM.. 235.
- Article One - Accidental divisions of the syllogism..... 236.
- Article Two - The syllogism improperly so-called..... 239.

SECTION THREE - INDUCTION. .... 241.

CHAPTER TWENTY-SIX - INDUCTION. .... 241.
- Article One - Nature of induction. .... 242.
- Article Two - Division of induction.................. 249.
- Article Three - Imperfect induction.................... 251.

SECTION FOUR - SOPHISTIC PROOF.................... 253.

CHAPTER TWENTY-SEVEN - PREAMBLES TO MATERIAL LOGIC....... 254.

CHAPTER TWENTY-EIGHT - SOPHISTIC PROOF. .... 255.
Article One - Sophistic proof in general. ....255.
Article Two - Sophisms or fallacies in diction............ 256.
Article Three - Sophisms or fallacies outside diction........ 258.
Article Four - Modern teaching regarding sophistry. 262

SECTION FIVE - PROBABLE PROOF. 265

CHAPTER TWENTY-NINE - PROBABLE OR DIALECTIC PROOF. 265
Article One - Nature of probable proof. 265
Article Two - The two probable or dialectical syllogisms...268
Article Three - The principles of the probably syllogism.... 269

SECTION SIX - CERTAIN OR SCIENTIFIC PROOF, THAT IS, DEMONSTRATION, IN ITSELF......... 270

CHAPTER THIRTY - NATURE OF CERTAIN OR SCIENTIFIC PROOF OR DEMONSTRATION.............. 271

CHAPTER THIRTY-ONE - DIVISION OF CERTAIN PROOF OR DEMONSTRATION. 273

SECTION SEVEN - THE PREPARATION OF SCIENTIFIC PROOF OR DEMONSTRATION, OR THE DISCOVERY OF PRINCIPLES. 278

CHAPTER THIRTY-TWO - THE FOREKNOWNS TO DEMONSTRATION...279
Article One - Necessity of some foreknowns.............. 279
Article Two - Which are the foreknowns................ 280
Article Three - The evidence of the premisses............. 281
Article Four - Diverse species of principles of demonstration............................282

CHAPTER THIRTY-THREE - ORIGIN OF THE FIRST PRINCIPLES OF REASON AND OF PHILOSOPHY. 283
Article One - Origin of the first principles of reason or dignities. 284
Article Two - Origin of the common principles of philosophy. 287

CHAPTER THIRTY-FOUR - THE DISCOVERY OF SCIENTIFIC LAWS....288
Article One - Origin of scientific laws. 288
Article Two - Value of laws, discovered by induction, as principles of proof.........................291

SECTION EIGHT - EFFECT OF DEMONSTRATION, OR SCIENCE IN GENERAL. .... 296.

CHAPTER THIRTY-FIVE - NATURE OF SCIENCE. .... 297.
Article One - That science is the formal effect of demonstration. .... 297.
Article Two - Nature of science in general. .... 298.

CHAPTER THIRTY-SIX - ORIGIN OF SCIENCES. .... 300.

CHAPTER THIRTY-SEVEN - SPECULATIVE AND PRACTICAL SCIENCE. .... 301.
Article One - Division of science into speculative and practical science. .... 302.
Article Two - Nature of practical science. .... 302.

CHAPTER THIRTY-EIGHT - SPECIFICATION AND DIVISION OF SPECULATIVE SCIENCES. .... 307.
Article One - Speculative sciences are specified from their formal object. .... 307.
Article Two - The diverse degrees of abstraction. ..... 311.
Article Three - The diverse speculative sciences. ..... 316.
Article Four - Modern divisions of the sciences. ...... 319.

CHAPTER THIRTY-NINE - SUBALTERNATION OF SCIENCES. .....324.
Article One - Notion of subalternation. .... 324.
Article Two - Subalternation by reason of end. .... 325.
Article Three - Subalternation by reason of principles. . 326.
Article Four - Subalternation by reason of objects. .... 327.
Article Five - Effect of subalternation. .... 329.

SECTION NINE - SCIENCES IN SPECIAL. .... 331.

CHAPTER FORTY - MATHEMATICS. .... 331.
Article One - Mathematical notions. .... 332.
Dissertation One - Object of mathematics. .... 332.
Dissertation Two - Number. .... 332.
Dissertation Three - Geometrical notions. .... 334.
Dissertation Four - Origin of geometrical notions. .... 335.
Dissertation Five - Mathematical definitions. .... 337.
Article Two - Mathematical principles or propositions. 338.
Dissertation One - "Axioms" and "postulates". .... 338.
Dissertation Two - Nature of the "postulates". .... 339.
Article Three - Mathematical demonstration. .... 342.
Dissertation One - In mathematics there is true deduction. .... 343.
Dissertation Two - In mathematics there is no room for induction. .... 344.
Dissertation Three - Mathematical deduction is of the same species as in other sciences. .... 345.

CHAPTER FORTY-ONE - THE SCIENCES OF NATURE. .... 346.
Article One - Scientific facts. .... 347.
Dissertation One - Nature of the sciences of nature. .... 347.
Dissertation Two - Nature of scientific fact................. 348.
Dissertation Three - Determination of a scientific fact......... 349.

Article Two - Scientific laws. .... 350.
Dissertation One - Nature of scientific laws................. 350.
Dissertation Two - Determination of scientific laws. .... 352.
Dissertation Three - Scientific conclusions. .... 358.

Article Three - Scientific theories. .... 360.

CHAPTER FORTY-TWO - MORAL SCIENCE. .... 365.
Article One - Whether now moral philosophy is true practical science. .... 365.
Article Two - Whether now there is philosophical moral science. .... 366.

CHAPTER FORTY-THREE - SOCIOLOGY. .... 369.
Article One - Object of sociology. .... 370.
Article Two - Nature of sociology. .... 372.

CHAPTER FORTY-FOUR - HISTORY. .... 374.
Article One - Nature of history. .... 375.
Article Two. - Method of history. .... 376.

APPENDIX I .... 380.

****

LOGIC.

....
....
....

CHAPTER ONE.

....

INTRODUCTION TO LOGIC.

....

1. ORDER OF PROCEDURE: This introduction to logic:

A. Will treat:
a. First, of the necessity of logic.
b. Secondly, of the nature of logic: regarding which will be dealt with:
b1. In the first place, its character as science and as art;
b2. In the second place, its formal object.
c. Thirdly, the division of logic: concerning which will be exposed:
c1. In the first place, certain preliminary notions;
c2. In the second place, the very division of logic.

B. Hence the following order:-

Introduction to Logic:
- Its necessity..................................Article one.
- Its nature
  - Its character as science and art..........Article two.
  - Its formal object........................Article three.
- Its division
  - Certain preliminary notions............Article four.
  - The division itself......................Article five.

....

ARTICLE ONE.

NECESSITY OF LOGIC.

2. CONCLUSION: As will appear from the considerations exposed below (nn.3-5), it must be said that LOGIC IS SIMPLY NECESSARY FOR THE ACQUISITION OF SCIENCE IN ITS PERFECT STATE.

3. NATURAL LOGIC AND ARTIFICIOUS OR ACQUIRED LOGIC: The distinction between natural logic on the one hand, and artificious or acquired logic on the other, is manifest from the following:

A. Every man, according as he has the natural power of reasoning, is endowed with a certain NATURAL logic, whereby he is capable of accomplishing reasonings necessary for his daily life. Of this, it is not question here.

B. But it is question here of ARTIFICIOUS logic:
a. Which is a quality:
a1. superadded to the intellect,
a2. and acquired by study;
b. Whereby is perfected the natural logic which everyone having reason naturally enjoys.

4. DESCRIPTION OF ARTIFICIOUS LOGIC: This is described by St Thomas: THE ART DIRECTIVE OF REASON ITSELF, THAT IS, WHICH ENABLES MAN TO PROCEED IN THE VERY ACT OF REASON ORDINATELY, EASILY AND WITHOUT ERROR. (In Anal. Post., lib.1, lect.1, n.1).

5. NECESSITY OF ARTIFICIOUS LOGIC: This logic is necessary, not only for the easy acquisition of science in its perfect state, but for the very acquisition of science in that state.

A. It is not therefore to be denied that natural logic suffices for the acquisition of some imperfect rudiments of science.

B. But it must be said that this natural logic is not sufficient for obtaining perfect science:

a. Therefore it is to be said that artificial logic is simply necessary,

b. In such fashion that, in default of it, the very acquisition of perfect science is quite impossible.

C. For the possession of perfect science is achieved by [illegible] aid of a certain quality acquired by study, a quality whereby the intellect is rendered capable of reasoning perfectly in some determinate scientific matter.

a. For the natural, very imperfect, power of reasoning of the intellect is not sufficient for perfect scientific reasoning.

b. But our intellect cannot obtain this perfection with regard to a special matter, unless it be previously perfected with regard to scientific reasoning in general: but this perfection is obtained by the study of artificial logic.

b1. For our intellect is not naturally capable of scientific reasoning, as is shown fully in natural philosophy (in psychology): therefore it must acquire this capability.

b2. Then again, reasoning in a determinate scientific matter depends on the general mode of reasoning perfectly.

....

ARTICLE TWO.

CHARACTER OF LOGIC AS SCIENCE AND ART.

6. CONCLUSION: As will appear from the consideration exposed here-under (nn.7-8), it must be said that LOGIC IS A SPECULATIVE SCIENCE AND TOGETHER A LIBERAL ART BUT IMPROPERLY SO-CALLED.

7. SPECULATIVE SCIENCE: Logic, whereby is acquired the quality of reasoning perfectly, is constituted through knowledge of the causes of reasoning: for which reason it is truly a science, that is, knowledge through causes.

A. Nor is it any obstacle to this:

a. That St Thomas, describing logic (cf. n.4), says that it is an art.

b. For, as St Thomas himself says: "This art........is a rational science."

B. But this science is speculative: because the end of this science is knowledge itself (ipsum scire).

8. ART: Nevertheless, logic is together an art, to wit, a quality ordered towards a work to be produced; for art is "right reason about makeables - recta ratio factibilium".

A. For knowledge of the theory of reasoning is ordered towards the making of perfect reasonings.

B. But this work produced is purely internal, and is nothing else than the work of speculation itself.

a. Therefore logic is an art IMPROPERLY SO-CALLED: for of art properly so-called the work is EXTERNAL, such as a bridge, or a statue, or a picture, or an engine, or an oration, or a farm.

b. Moreover, logic could not be together;

b1. A speculative science, that is, a science whereof the end is internal (knowledge itself),
b2. And an art properly so-called, whereof the work is external.

....

ARTICLE THREE.

FORMAL OBJECT OF LOGIC.

9. CONCLUSION: As will be evident from the consideration set forth hereunder (nn.10-12), it must be said that THE FORMAL OBJECT OF LOGIC IS MENTAL BEING OF SECOND INTENTION (ens rationis secundae intentionis).

10. THE FORMAL OBJECT OF LOGIC IS A MENTAL RELATION: No one denies that logic deals with mental relations, that is, relations which can exist in intellect only, between Predicate and Subject, and between the diverse propositions of reasoning. But the question is: Whether the primary and essential reference of logic is to these relations?

A. For since logic is the art directive of reason itself to the attainment of the true, the question formally concerns the artificial order necessary to attain the true, to wit:
a. Whether this order consists in the acts of the mind inasmuch as they are directible; or, in other words, in something real?
b. Or whether this order consists in the very ordination of concepts by way of subject and predicate, and of middle term; or, in other words, in some mental relation?

B. Against Suarez, who holds the former opinion, to wit, that the object of logic is the acts as directible, or in other words, real being, it must be said, with St Thomas and Thomists, that the formal object of logic is the MENTAL RELATION (relatio rationis) resulting from the ordering of concepts by way of subject and predicate and middle term.

a. For:
a1. The formal object of logic must be that which suffices to direct reason to the true.
a2. But by the sole ordering of concepts by way of subject and predicate and middle term - which ordering is a mental relation - is reason sufficiently directed to the attainment of the true.

b. Moreover:
b1. There is in the opposite opinion a danger of confusing the formal object of logic and of criticism;
b2. And perhaps in this is found the reason why often the Suarezians understand, under the name of Major Logic, the Criticism of knowledge, allocating the treatment of the critical problem, not to metaphysics, but to logic. (Cf. Defensive Metaphysics, nn.5-13).

11. THIS RELATION IS A MENTAL BEING, AND OF SECOND INTENTION: But the reason why these mental relations by way of subject and predicate and middle term are said to be MENTAL BEINGS (entia rationis), is sufficiently evident, since they cannot exist save in mind.

A. For:
a. Being which exists or can exist in the nature of things, or in the real, is called REAL being.
b. But being which neither exists nor can exist outside mind is called MENTAL being (ens rationis).

B. However, the mental being, whereof it is question in logic, has this proper characteristic, that it is not obtained save by a second intention (consideration) of the mind. If, for example, I say: "Peter is a man":

a. The first intention of the mind is borne both upon the individual whose name is Peter, and upon the rational animal which is designated by the word 'man'.

b. But that 'man' is considered as predicate, that is as related to 'Peter', or vice versa, this occurs only by a certain reflexion, or, in other words, by a SECOND INTENTION.

12. ESSENTIAL DEFINITION OF LOGIC: Hence, logic can be defined essentially:

A. Either from its adequate formal object: THE SPECULATIVE SCIENCE OF MENTAL BEING OF SECOND INTENTION.

B. Or from its object of attribution: THE SPECULATIVE SCIENCE OF REASONING. (Note that the object of attribution of a science is that whereunto everything which is treated in a given science is attributed or ordered; as for example, movable body in natural philosophy, and substance in metaphysics).

C. Or from its principal object: THE SPECULATIVE SCIENCE OF DEMONSTRATION. (Note that the principal object of a science is that which is more principally and principally intended by a given science, so that everything which is treated in that science is treated intentionally on account of it; as for example, Pure Act in metaphysics). (Cf. Pirotta: Summa Philosophiae, Vol.I, p.146).

....

ARTICLE FOUR.

CERTAIN PRELIMINARY NOTIONS.

13. REASON: The reason is a cognoscitive power, but not indeed a power other than the intelligence (understanding, intellect). "But from the point of view of the functioning of this faculty:

A. "It is called more especially the intelligence when it sees, grasps, or 'apprehends';

B. "And more especially the reason when it proceeds through discourse from the apprehension of one thing known to another." (Maritain: Introduction to Logic, p.1).

C. "What act is proper to the reason as such? REASONING." (Maritain: ibid.).

14. REASONING: "We reason when we think for instance:

"The spiritual is incorruptible,
but the human soul is spiritual,
therefore it is incorruptible.

A. "Reasoning is the most complex operation of our mind; it is by reasoning that we go from what we know already to what we do not yet know, that we discover, that we demonstrate, that we make progress in knowledge.

B. "Since logic studies the reason as a means of acquiring knowledge:

a. "It must consider first and foremost among the operations of the mind, reasoning.

b. "There are other operations of the mind which logic must also consider.

c. "It will consider them in relation to reasoning, as factors in it.

C. "The act of reason is one or undivided, like the act of taking three steps towards a goal. One, two, three, we have reached the goal: we have taken three steps, but we moved without stopping, with an undivided movement.

a. "We reason likewise with an undivided movement;

b. "But we do not reason for the mere pleasure of running, or 'discursing' from idea to idea, but indeed to conclude, to render evident to ourselves some truth in which we stop.

c. "Yet the act of reason is a complex act; it is one or undivided, but it is not simple or indivisible; on the contrary it is composed of several distinct acts in orderly sequence, each of which bears upon an enunciation similar to the three enunciations in the example given above and which we call propositions.

d. "Each of these acts taken in itself is called a JUDGMENT." (Maritain: op.cit. pp.1-2).

15. JUDGMENT: "This is another operation of the mind which is anterior to the reasoning and is presupposed by it.

A. "To judge is to affirm or to deny; it is to think for example,

"Caution is the mother of safety,

or again,

"Formal dress is not a considerable nuisance.

B. "Im the first judgment we affirm of the term 'caution' this other term 'mother of safety', that is, we identify these two terms saying: there exists one same thing (a same subject) to which both the name 'caution' and the name 'mother of safety' belong at the same time. In the second judgment we deny to the term 'formal dress', this other term 'considerable nuisance'.

C. "By judging we declare ourselves to be in possession of the truth on this or that point. A wise man is one who judges well.

D. "The act of judging:

a. "Is one or undivided, as the act of taking a step; it is even, strictly speaking, a simple or indivisible act. Thus, in the example given above, the judgment does not consist in the juxta-position of three different acts of thought - an act of thought for 'caution', another for 'is' and a third for 'mother of safety', but indeed in a single act of thought.

b. "It bears nevertheless upon a complex object (a proposition constructed by the mind),

b1. "And just as a step is a movement between two terms, between a point of departure and a point of arrival,

b2. "So the act of judging is a movement of thought, translated by the word 'is', which unites two different notions, expressed by:

b2a. "the word-subject,

b2b. "and the word-attribute or predicate.

c. "Each of these notions corresponds to a certain act of the mind called conception, perception, or SIMPLE APPREHENSION." (Maritain: op. cit. pp.2-3).

16. SIMPLE APPREHENSION: "This is another operation of the mind, anterior to judgment and presupposed by it.

A. "To conceive is to form in the mind an idea in which one sees, grasps, or 'apprehends' something. It is to think, e.g.

"'man'
or 'caution'
or 'unfortunate'.

B. "This act is evidently at the very root of all our intellectual knowledge, and that is why it is of the first importance. For by this act an object of thought is offered to the sight or grasp of our intelligence.

a. "This act of perception or apprehension is, however, so imperfect that although it does indeed present to us an object of thought discernible in a thing, it does not at the same time present to us the other objects of thought which are united to this one in the thing as it exists (its existence being either actual or possible).

al. "Consequently our mind, remaining in a state of suspense, has nothing as yet to affirm or deny. It is clear for example that if we think:

"'man'
'snow'
'delicate people'

we have but the beginning of a truth in our mind, our mind makes as yet no declaration of conformity with the real; this declaration is not made, nor is there a completed truth in our mind, unless we think for example (in a judgment):

"'man is mortal'
or 'snow is white'
or 'delicate people are unfortunate'

or the like.

a2. "In the same way we do not advance by simply lifting our foot off the ground, we advance only if we take a step.

b. "We may say then that in making an act of simple apprehension our mind merely grasps a thing without affirming or denying anything about it.

C. "This act:

a. "Is not only one or undivided, but also simple or indivisible: the act of thinking 'man' or 'snow' is obviously an act which admits of no parts.

b. "Furthermore it bears upon an object:

bl. "which is either indivisible itself (as an object of thought, e.g. 'man'),

b2. "or at least is apprehended in the same way as indivisible objects, that is, without involving any construction erected by the mind.

c. "Hence it is called an act of simple apprehension.

D. "The act of conception or simple apprehension is thus a primary operation which presupposes no other intellectual operation.

a. "Undoubtedly it does not constitute our first act of knowledge (for it presupposes the operations of the senses),

b. "But it constitutes our first INTELLECTUAL operation, it is the first operation of the mind." (Maritain: op.cit. pp.3-4).

17. THREE OPERATIONS: "The three operations of the human mind are:

A. "Simple apprehension.

B. "Judgment.

C. "And reasoning." (Maritain: op.cit. p.4).

18. "THE OPERATION OF THE MIND AND ITS PRODUCTS: The study of the operations of the mind and of their inmost mechanism belongs to psychology.

A. "But we may note here the distinction between:

a. "The operation itself or act of the mind,

b. "And the product which the mind produces thereby within itself.

B. "The act:

a. "Of judging, for example:

al. "is an operation of the mind involving the production or construction in the mind of a certain group of concepts,

a2. "which we call an enunciation or proposition.

b. "There:

bl. "is as much difference between:

bla. "the action of assembling concepts and judging,

blb. "and the constructed group itself,

b2. "as there is between:

b2a. "the action of building a house,

b2b. "and the house when built.

C. "The thought-proposition (the group of concepts) is distinguished in turn from the verbal proposition which explains it in words and is its oral sign. There is as much difference between the one and the other as between the house itself and some representation of it.

a. "By verbal propositions we understand:

a1. "those that are actually spoken - groups of words spoken aloud -

a2. "as well as those which are spoken only in the mind - groups of words formed in the imagination.

b. "When we think, for example, 'man is mortal':

b1. "We affirm that which is presented to us by the idea of mortal, of that which is presented by the idea of man.

b2. "But at the same time in which we form this proposition in the mind, we imagine the verbal proposition by which it is expressed (and sometimes we really form its phonetic equivalents with our lips).

c. "The thought-proposition (the group of concepts) evidently:

c1. "differs as much from the mentally-spoken proposition (the group of auditory or muscular images of articulate sounds),

c2. "as it does from the actually-spoken proposition.

D. "To make more precise the meaning of the terms........we may construct the following table of the operations of the mind:

"THE OPERATIONS OF THE MIND AND ITS PRODUCTS"

THE OPERATION	THE PRODUCT	THE SIGN
I. Determined by a likeness of the object received through the senses - by means of abstraction - the mind forms or 'says' within itself..........	an idea (or MENTAL CONCEPT) in which	
it sees, grasps or apprehends (SIMPLE APPREHENSION) a certain essence or object of a concept (which logicians also call an OBJECTIVE CONCEPT)................................		and it designates this idea by a word (TERM) which is itself signifiable by a graphic sign (a written word): man.
Having thus seen or apprehended, the mind may now produce within itself..........................	a complex concept relating in detail what it has seen. This is the DEFINITION OF THE THING...	of which the oral sign is a verbal DEFINITION (a group of words): rational animal.
II. The mind constructs (COMPOSITION AND DIVISION).......	a group of two concepts (Subject and Predicate) whose	
agreement or disagreement it apprehends and which it affirms or denies one of the other by a simple act (a JUDGMENT) bearing upon...........................	this group of concepts or PROPOSITION. This has............	for its oral sign a spoken PROPOSITION (a group of words): man is a rational animal.

III. The mind sees or apprehends......................	a grouping of propositions (antecedent)	
as 'inferring' or rendering necessarily true................	another proposition (consequent)	
which it 'concludes' from the preceding propositions. This is the REASONING which constructs.........................	a group of propositions called ARGUMENTATION, whose......	oral sign is the verbal ARGUMENTATION (group of spoken propositions): man is a rational animal; but every philosopher is a man; therefore every philosopher is a rational animal.

a. "In:

al. "The first column we have written that which concerns the acts or operations of the mind;

a2. "In the second that which concerns the products that are formed in the mind;

a3. "And in the third the oral and material signs of these mental products.

b. "Everyday language ordinarily confuses these three orders of things:

bl. "because in many cases what is said of the product may also be said of the operation;

b2. "and because it is natural for man to call things which are signified by the same name by their sign only, for this is more familiar to him.

c. "Nevertheless, to take examples:

cl. "A judgment is a vital act;

c2. "A (thought) proposition is an immaterial organism composed of several concepts;

c3. "A verbal proposition is an inert composite of material parts (words) in juxtaposition in time (oral proposition) or in space (written proposition).

d. "These distinctions are highly important if logic is to be rightly understood.

dl. "........Leibnitz and certain logicians in his tradition tend to neglect the operation for the product, and the immaterial product of the mind for its material sign.

d2. "On the other hand, in its critique of the intellect, the Anti-Intellectualist school (James, Bergson, Le Roy), often confuse the operations and products of the intelligence with the material signs by which they are expressed.

d3. "No one has anywhere made clearer the distinction between the thought and the material signs which express it than Aristotle. The object of his logic:

d3a. "is precisely the immaterial products of the mind,

d3b. "and not the spoken or written words, which he treats only insofar as they are external signs of these products." (Maritain: Introduction to Logic, pp.4-8).

....

ARTICLE FIVE.

DIVISION OF LOGIC.

19. ACCIDENTAL DIVISION: Very frequently found in authors:

A. Is the division of logic into:
a. FORMAL logic or the art of reasoning ordinately and easily;
b. MATERIAL logic or the art of reasoning without error.

B. But we leave this division aside:
a. Because it follows the description of logic, not its essential definition.
b. Because it is accidental.

20. ESSENTIAL DIVISION: On the contrary the division from formal object is to be taken, which is ESSENTIAL. Therefore logic is divided according to the division of mental being of the second intention, according as it is found in the three operations of the mind, to wit, in the first and second through reference to the third.

A. In the first operation: predicability.

B. In the second operation: predication.

C. In the third operation: illation or inference.

21. PARTS OF LOGIC, AND ORDER OF PROCEDURE: Hence:

A. Three parts of logic, to wit:
a. The first part: ON PREDICABILITY.
b. The second part: ON PREDICATION.
c. The third part: ON ILLATION OR INFERENCE.

B. Hence the treatise of logic will proceed according to the following order:-

Logic	First part: ON PREDICABILITY	Book one.
	Second part: ON PREDICATION	Book two.
	Third part: ON ILLATION	Book three.

……

BOOK ONE.

....

....

...

FIRST PART OF LOGIC: ON PREDICABILITY.

....

....

...

22. GENERAL VIEW OF THIS PART: This first part of logic:

A. Will be exposed in *four sections*, to wit:

a. FIRST SECTION: *Pre-ambles to the study of predicability*: wherein will be dealt with:

- a1. *First, simple apprehension*, which is the CAUSE of predicability.
- a2. *Secondly, the concept*, which is the WORK of apprehension: which will be considered:
  - a2a. *In the first place*, in ITSELF.
  - a2b. *In the second place*, in its SIGN.

b. SECOND SECTION: *On predicability in general*: wherein will be dealt with:

- b1. *First*, the nature of the *universal* in ITSELF.
- b2. *Secondly*, the *universal* relatively to its INFERIORS.

c. THIRD SECTION: *On predicability in special*: wherein will be dealt with:

- c1. *First*, UNIVOCAL predicability: concerning which will be treated:
  - c1a. *In the first place*, univocal predicability *in signified act* or the PREDICABLES.
  - c1b. *In the second place*, univocal predicability *in exercised act* or the PREDICAMENTS.
- c2. Secondly, ANALOGOUS predicability.

d. FOURTH SECTION: *On the sign of predicability or definition*.

B. Which may be thus exhibited schematically:-

On predicability:
- Pre-ambles to the study of predicability: (FIRST SECTION)
  - On simple apprehension, which is the CAUSE of predicability:
    - Notion of apprehension
    - On abstraction.
  - On the concept, which is the WORK of apprehension and whereof predicability is a property, considered
    - IN ITSELF
      - Its nature.
      - Its division.
    - In its SIGN.
- On predicability itself:
  - In itself
    - In GENERAL: (SECOND SECTION)
      - On the universal in ITSELF.
      - On the universal relatively to its INFERIORS.
    - IN SPECIAL: (THIRD SECTION)
      - On UNIVOCAL predicability
        - On univocal predicability in signified act or on the PREDICABLES.
        - On univocal predicability in exercised act or on the PREDICAMENTS.
      - On ANALOGOUS predicability.
  - In its sign or on DEFINITION (FOURTH SECTION).

……

SECTION ONE.

……

PRE-AMBLES TO THE STUDY OF PREDICABILITY.

……

23. ORDER OF PROCEDURE: What this exposition of the pre-ambles to the study of predicability will embrace is sufficiently known from what has been exposed above (n.22). Accordingly it will proceed to the following order:-

Pre-ambles to the study of predicability:
- On simple apprehension, which is the CAUSE of predicability................ Chapter two.
- On the concept, which is the WORK of apprehension and whereof predicability is a property, considered
  - In ITSELF............Chapter three.
  - In its SIGN..........Chapter four.

....

CHAPTER TWO.

....

SIMPLE APPREHENSION WHICH IS THE CAUSE OF PREDICABILITY.

....

24. ORDER OF PROCEDURE: This consideration of simple apprehension:

A. Will:
a. First, expose the notion of simple apprehension.
b. Secondly, expose by what means the intellect apprehends essences.

B. Hence the following order:-

Simple apprehension which is the cause of predicability:
- Its notion.................. Article one.
- By what acts does the intellect apprehend essences............Article two.

....

ARTICLE ONE.

NOTION OF SIMPLE APPREHENSION.

25. DEFINITION OF SIMPLE APPREHENSION: The first operation of the mind, very imperfect indeed and of its own nature (per se) ordered towards judgment, is called SIMPLE APPREHENSION.

A. To psychology does it pertain to vindicate the EXISTENCE of this operation, against the denial of many moderns outside the scholastic tradition.

B. It is THE OPERATION WHEREBY THE INTELLECT UNDERSTANDS SOME QUIDDITY, WITHOUT AFFIRMING OR DENYING ANYTHING OF IT.

C. The OBJECT of this operation is a quiddity, ESSENCE, that which something is.
a. Wherefrom:
a1. It is immediately apparent that this definition cannot be accepted save by those who admit that the human intellect knows essences - which likewise is proved in psychology.
a2. Let it suffice for the present to retain this, that common sense (natural understanding) approves this definition: if, for example, I say 'man' or 'dog', these words which express objects of simple apprehension, signify, for common sense, THAT WHICH MAN OR DOG IS, and so on.

b. Thus Maritain writes: "THE FORMAL OBJECT of simple apprehension is always SOME ESSENCE, NATURE OR 'QUIDDITY'.........Here we may take the words 'essence', 'nature', and 'quiddity' in their broadest sense as meaning what something is (some object which I attain in pronouncing a name), or again what this idea or this name sets before me. I grasp a certain essence, in this sense, whenever I think - e.g. 'living body', 'animal', 'French', 'Peter'. Thus everything grasped by means of simple apprehension is, as such, ONE essence." (Introduction to Logic, pp.12-13).

c. Lest what is said here be misunderstood, note the following words of Maritain: "Certain modern authors have misunderstood this term 'the apprehension of essences' to mean that, by the power of abstraction, the mind may at once perceive the inmost constitution of a thing. The scholastics never held any such doctrine. For them, abstraction transports us from the sensible to the intelligible plane, and introduces us into the order of essences and their necessary laws. But the intelligible objects, the 'natures' or 'essences' perceived in simple apprehension, far from putting us in possession of the innermost constitution of things are, at first, but the simplest and most intelligible aspects, which are grasped in the things themselves (first of all and at the very outset, 'being' as an object of thought). Thus the concept of 'fire' which I derive from sense experience does not unfold to me the innermost nature and mysteries of 'ignition'; at first it is simply a concept of something with a determinate nature (as yet unknown to me) which appears under certain sensible aspects. Only later do I penetrate this nature and know it as the combination of a body in its gaseous state with the oxygen of the air. Undoubtedly it was this very thing that the concept of fire revealed to me, but in a hidden way.

- And even if we do succeed in attaining an explicit knowledge of the essences or the inmost constitutions of some few things, nevertheless, in a great many cases (especially in the inductive sciences) we have to be content with imperfect knowledge through external signs." (Introduction to Logic, p.13, note 2).

D. Absence of affirmation and of negation which are the specific differences of judgment, is essential to simple apprehension.

26. SIMPLE APPREHENSION AS THE "UNDERSTANDING OF INDIVISIBLES": Simple apprehension is called also the understanding of indivisibles "inasmuch as the intellect understands absolutely the quiddity of each thing, or an essence through itself, for example, what is man, or what is white, or something of that kind." (Periherm., lib.1, lect.3. S.Thomae, n.3: cf. Metaphys. VI, lect. S. Thomas, n.1232, ed. Cathala.).

A. Note that the second of the examples given, viz. 'white' or 'a white thing' signifies a complex essence, i.e. an essence composed of two quiddities:

a. a certain thing, e.g. snow;
b. and whiteness which is a property of the snow.

B. However there is no difficulty in the name "understanding of indivisibles", for:

a. Although in these cases its object is divisible,
b. Yet, since it is apprehended by way of a one,
c. It is known after the manner of an indivisible.

....

ARTICLE TWO.

BY WHAT ACTS IS SIMPLE APPREHENSION EXERCISED?

27. CONCLUSION: As will appear from what is said hereunder (nn.28-30), it is to be said that THE INTELLECT UNDERSTANDS ESSENCES ABSOLUTELY BY MEANS OF ABSTRACTION, RELATIVELY BY MEANS OF COMPARATIVE APPREHENSION.

28. ESSENCES APPREHENDED IN TWO WAYS: In two ways does the intellect apprehend essences:

A. Both ABSOLUTELY in themselves;

B. And RELATIVELY, insofar as these essences are considered as referable to other objects. This latter apprehension, like the former, pertains to the first operation of the mind, as is shown fully in psychology.

29. ABSTRACTION AND COMPARISON: **Yet these** acts, though they both pertain to the first apprehension of the mind, are diversely named:

A. ABSTRACTION bespeaks THE ACT OF SIMPLE UNDERSTANDING WHICH CONSIDERS A THING ACCORDING TO ITSELF, ABSTRACTED FROM ALL RELATION TO ANOTHER. And abstraction indeed is twofold:

a. FORMAL abstraction, WHEREBY SOME QUIDDITY IS ABSTRACTED FROM ITS SUBJECT, as for example:
a1. Whiteness, which is abstracted from snow;
a2. Hardness, which is abstracted from steel;
a3. Quantity, which is abstracted from sensible matter. (Cf. Cajetan: In De Ente et Essentia, ed. Laurent, pp.6-7).

b. TOTAL abstraction, WHEREBY SOME SUPERIOR UNIVERSAL - i.e. some universal having greater extension - IS ABSTRACTED FROM ANOTHER INFERIOR UNIVERSAL -- i.e. a universal having less extension - : e.g. animal - a universal which is superior relatively to horse and lion, - which is abstracted from horse and from lion.

B. COMPARISON, on the contrary, is THE ACT OF SIMPLE UNDERSTANDING WHEREBY IS APPREHENDED A NATURE AS RESPECTING OTHERS TO WHICH IT IS ORDERED.

30. NATURE KNOWN BY ABSTRACTION, AND NATURE APPREHENDED BY COMPARISON: Therefore a nature, known by abstraction, differs from a nature apprehended by comparison.

A. For a nature known by abstraction respects inferiors (i.e. universals having less extension) as a term WHEREFROM it is abstracted, and it is called, as we shall see below, a metaphysical universal.

B. But a nature apprehended by comparison is referred to inferiors as orderable towards them (i.e. it is referred to them as to a term WHEREUNTO), and it is called a logical universal, as will be explained below.

……

SCHEMATIC SUMMARY.

31. SCHEMATIC RECAPITULATION: What has been said in the fore-going chapter may be thus schematically summarized:-

On simple apprehension:
- ITS NOTION
  - It is defined: THE ACT WHEREBY THE INTELLECT UNDERSTANDS SOME QUIDDITY, WITHOUT AFFIRMING OR DENYING ANYTHING OF IT.
  - Hence
    - Its object is: a quiddity, ESSENCE, what something is.
    - Absence of affirmation and negation is essential to it.
- THE ACTS WHEREBY IT IS EXERCISED are:
  - ABSTRACTION
    - Which is: AN ACT OF SIMPLE UNDERSTANDING WHICH CONSIDERS A THING ACCORDING TO ITSELF, ABSTRACTED FROM ALL RELATION TO ANOTHER.
    - And which is twofold, to wit:
      - Either FORMAL, WHEREBY SOME QUIDDITY IS ABSTRACTED FROM ITS SUBJECT.
      - Or TOTAL, WHEREBY SOME SUPERIOR UNIVERSAL IS ABSTRACTED FROM ANOTHER INFERIOR UNIVERSAL.
    - And whereby is obtained
      - a universal respecting its inferiors as a term WHEREFROM it is abstracted.
      - Which universal is called a metaphysical universal.
  - COMPARISON
    - Which is: AN ACT OF SIMPLE UNDERSTANDING WHEREBY IS APPREHENDED A NATURE AS RESPECTING OTHERS TO WHICH IT IS ORDERED.
    - And whereby is obtained
      - a universal which is ordered to its inferiors as a term WHEREUNTO it is orderable.
      - Which universal is called a logical universal.

……………………………………………

CHAPTER THREE.

……………

THE CONCEPT, WHICH IS THE WORK OF APPREHENSION, IN ITSELF.

……………………………………………

32. ORDER OF PROCEDURE: This consideration of the concept, which is the work achieved or produced by simple apprehension;

A. Will consider:
a. First, the concept in itself. Concerning which will be treated:
a1. In the first place, the nature of the concept: regarding which will be exposed:
a1a. The notion of the formal and objective concept.
a1b. And then, by what is determined the nature of the concept: with respect to which:
a1b1. Will be exposed the elements of the concept.
a1b2. Will be established the determination of the nature of the concept by its comprehension.

a2. In the second place, the divisions of the concept.
b. Secondly, the concept in its relations with other concepts.

B. Hence the following order of procedure:-

On the concept
- In itself
  - Its Nature
    - Notion of the formal and objective concept..................Article one.
    - Determination of the nature of the concept
      - Elements of the concept..........Article two.
      - Determination of its nature by its comprehension........Article three.
  - Its divisions............................Article four.
- In its relations with other concepts.............Article five.

……

ARTICLE ONE.

FORMAL AND OBJECTIVE CONCEPT.

33. NECESSITY OF ABSTRACTION: The nature (or quiddity), which is the object of simple apprehension:

A. Is not the external thing in its singular existence, which, as material, is not proportionate to our intellect, as is shown in psychology.

B. And so the nature is not apprehended immediately unless abstracted from the singular.

34. THE FORMAL CONCEPT: This abstractive apprehension requires that it have a term which, since in the real are found only singular things, has to be produced by the very act of knowledge, - which production is treated in psychology. This term is the WORK of apprehension which is the CONCEPT.

A. However, this term produced by knowledge is not that which is known, but is that wherein we understand immediately the very nature of the external thing, abstracted from its singular existence, as common sense itself testifies:

a. For not the same is it:
a1. to know man;
a2. and to know the idea of man.
b. Even further:
b1. I know:
b1a. what is, according to the truth of the thing, man,
b1b. before the idea of man;
b2. Or, in other words, I know:
b2a. man as he is in the real,
b2b. before man as he is in my mind.

B. This term, "EXPRESSED BY THE MIND AND IN THE MIND, WHEREIN WE UNDERSTAND THE THING (nature)" is called the FORMAL CONCEPT (or MENTAL CONCEPT). In the formal concept are to be distinguished these two:

a. Some essence, which is IDENTICAL with the essence of some external thing.
b. The existence which this essence has in the mind:
b1. which differs from the singular existence which the thing has in the real;

b2. by virtue of which difference the formal concept, i.e. the essence as it exists in the mind, is SIMILAR to, not identical with, the essence as it exists in the real.

35. THE OBJECTIVE CONCEPT: But the essence of the formal concept, abstracted from its mental existence:

A. Is the object of apprehension.

B. And is called the OBJECTIVE CONCEPT, which accordingly is: THAT WHICH WE KNOW OF SOME THING.

C. Whereas:
a. The consideration of the formal concept pertains rather to psychology;
b. The objective concept chiefly is dealt with in logic.

36. EVERY ESSENCE CAN BE AN OBJECTIVE CONCEPT: Every essence (nature, quiddity) can be an object of apprehension or an objective concept:

A. Whether it be a real essence, which:
a. Exists (ACTUAL essence) in THE REAL,
b. Or can exist (POSSIBLE essence) in THE REAL.

B. Or an essence of reason (essence of mental being), which exists (ACTUAL essence) or can exist (POSSIBLE essence) in the MIND only. Of mental beings (entia rationis) there are three species:
a. Privations: v.g. blindness;
b. Logical mental beings (entia rationis logicae): v.g. affirmation, species, genus (relations of reason, mental relations).
c. Mathematical mental beings (entia rationis mathematicae): v.g. irrational number (a surd).

37. SCHEMATIC SUMMARY: The contents of this article may be thus schematically recapitulated:

On the formal and objective concept:

- ON THE FORMAL CONCEPT: Our apprehension:
  - Since it is *abstractive.*
  - Must produce a term:
    - Which is the FORMAL CONCEPT.
    - Which
      - is not *that which* is known.
      - But is *that wherein* we understand immediately the thing (the nature).
    - Which is defined: THE TERM "EXPRESSED BY THE MIND AND IN THE MIND WHEREIN WE UNDERSTAND THE THING" (the nature).
    - In which are to be distinguished
      - *Some essence* which is IDENTICAL with the essence of some external thing.
      - The *existence* which this essence has *in the mind*
        - Which *differs* from the singular existence which the thing has *in the real.*
        - In virtue of which difference the formal concept is SIMILAR TO, not identical with, the essence as it exists in the real.
- ON THE OBJECTIVE CONCEPT: This:
  - Is the *essence* of the formal concept.
    - Abstracted from its mental existence.
    - And IDENTICAL with the essence of the external thing.
  - And so is the *object* of apprehension or of the formal concept:
    - Not indeed the material object thereof.
    - But its *formal* object.
  - And is defined: THAT OF SOME THING WHICH WE KNOW BY MEANS OF THE FORMAL CONCEPT; or: THE OBJECT KNOWN INASMUCH AS IT IS AN OBJECT.
  - And can be verified in every essence:
    - Whether *real*, and then
      - Whether ACTUAL.
      - Or POSSIBLE.
    - Or *mental* (whether ACTUAL or POSSIBLE): which may be:
      - Either *Privation.*
      - Or logical mental being.
      - Or *mathematical* mental being.

……

ARTICLE TWO.

THE COMPREHENSION AND EXTENSION OF A CONCEPT.

38. EXPLANATION OF COMPREHENSION: Since the objective concept is identified with the essence of the external thing, of itself it is indivisible.

A. Nevertheless, our knowledge does not penetrate, by a single act, the essence of a thing, so as to know it at once distinctly, but only gradually and after several or many acts.

B. In each act, the intellect forms a formal concept by the essence whereof is obtained a certain objective concept.

C. The complex of these objective concepts, whereby is expressed more or less distinctly the nature of some thing, is called the comprehension of the objective concept.

39. DEFINITION OF COMPREHENSION: Therefore comprehension is defined: THE COMPLEX OF THE NOTES WHICH CONSTITUTE A CONCEPT. Thus, for example, the comprehension of the concept of man is: substance, composite, living, endowed with sensibility, rational.

A. NOTE however, lest this notion be falsely understood:
a. That the comprehension of a concept:
a1. is expressed indeed by many notes whereof the sum can be diverse, according as the nature is known more or less perfectly,
a2. without however the comprehension itself of the concept being varied;
b. For the notes of the comprehension express the very nature of the thing, or the constitution of the objective concept:
b1. in itself,
b2. not for us.

B. Therefore modern writers ERR, who, like Keynes and Goblot, propound a subjective notion of comprehension, which savours of nominalism.

a. KEYNES:

a1. Distinguishes comprehension and connotation:
a1a. He calls connotation the sum of the notes by which HERE AND NOW I understand explicitly such or such an object; in other words, by 'connotation' he means what we are actually and explicitly thinking about the several notes which we use to define the concept. Thus the connotation of the concept 'ruminant' would be 'animal that chews the cud', these notes being taken as including only what I am actually and explicitly thinking of in saying these words.
a1b. By the name 'comprehension' he designates the recognizable properties of some object (v.g. 'cloven-footed' in a ruminant).

a2. But this distinction is based in nominalism.
a2a. For if the comprehension expresses the essence of a thing, it virtually contains its properties, and therefore comprehension and connotation are the same.
a2b. Even more, comprehension, as said above, must be taken objectively:
a2b1. That is, comprehension designates the complex of the notes whereby the objective concept is constituted in itself.
a2b2. But Keynes, on the contrary, takes connotation subjectively, i.e. inasmuch as it is the complex of the notes whereby the concept is constituted:
a2b2a. not in itself,
a2b2b. but for us.

b. GOBLOT admits the same distinction, but:

b1. Says moreover that in the comprehension of a concept are contained, not only the properties necessarily derived from an essence, but all the concepts contained therein as species or sub-species, and all the properties which they in turn imply. (Cf. Goblot: Traite de Logique, ch.III: 'Le Concept et l'Idee', Scientia, t.XI, 1912). Therefore:

bla. In comprehension he includes extension itself (the sum of the concept's inferiors, so that, for example, Aryan, Semite, Negroid etc. right down to Peter and Paul, would be included in the comprehension of 'man'; and likewise in the comprehension of 'beast' would be included vertebrate, invertebrate etc, right down to this horse and this oyster).

blb. Whereas:

blbl. Connotation is increased when extension is diminished,

blb2. Comprehension, on the contrary, is increased as extension is increased.

blc. Distinction is to be made between concept and idea:

blcl. By the name 'CONCEPT' he designates an abstract and poor notion which contains only the elements of connotation;

blc2. Whereas by the name 'IDEA' he designates a notion which embraces the comprehension, which therefore is rich with all the determinations included in the comprehension.

bld. Finally, he says that the comprehension of a concept is measured by the number of propositions in which some concept can be the subject.

b2. Goblot:

b2a. Forgets that the differences contained under a genus are only in potency and 'per accidens', and not actually (or virtually) and 'per se'.

b2al. But in the comprehension of a concept are contained only those things which 'per se' befit the concept.

b2a2. Therefore illegitimately does he include extension in comprehension.

b2b. Likewise, illegitimately does he distinguish between idea and concept, for:

b2bl. The idea, according to his notion of it, does not contain actually, but only potentially, the differences included in it.

b2b2. The concept contains not only those things which are actually and explicitly expressed, but also, just as does the idea, all those things which are potentially contained.

b2b3. Wherefore 'idea' and 'concept' are not two diverse notions, but identical.

b2b4. Hence Goblot:

b2b4a. is too nominalistic in his notion of the concept;

b2b4b. and too realistic in his notion of the idea.

b2b5. Finally, the definition which he gives of comprehension:

b2b5a. Is valid only in necessary matter (in other words, when attribution is made 'per se', not 'per accidens').

b2b5b. Is a sign rather than a definition. (Cf. Maritain: Introduction to Logic, pp.22-27).

40. EXTENSION: A nature, abstracted by apprehension, becomes universal, and befits many individuals, to which the concept is said to be extended. Therefore the EXTENSION of a concept is DEFINED: THE MULTITUDE OF SUBJECTS TO WHICH THE CONCEPT BEFITS OR WHEREOF IT EXPRESSES THE NATURE. Thus, for example, the extension of 'dog' is the sum-total of all the brutes which are called by the name 'dog'.

A. According to Goblot:

a. The EXTENSION of a concept is measured by the number of propositions in which the concept can be the predicate.

b. This notion of extension is vitiated by the same vices as the definition of comprehension propounded by Goblot.

B. According to greater or less extension, a concept is said to be SUPERIOR or INFERIOR. Thus the concept 'animal' is superior to the concept 'man', this latter being inferior; whereas the concept 'man' is superior to the concept 'Hindoo', this latter being inferior.

a. A superior concept is called:

al. A POTENTIAL WHOLE, because its parts (its inferiors) are contained in it only potentially.

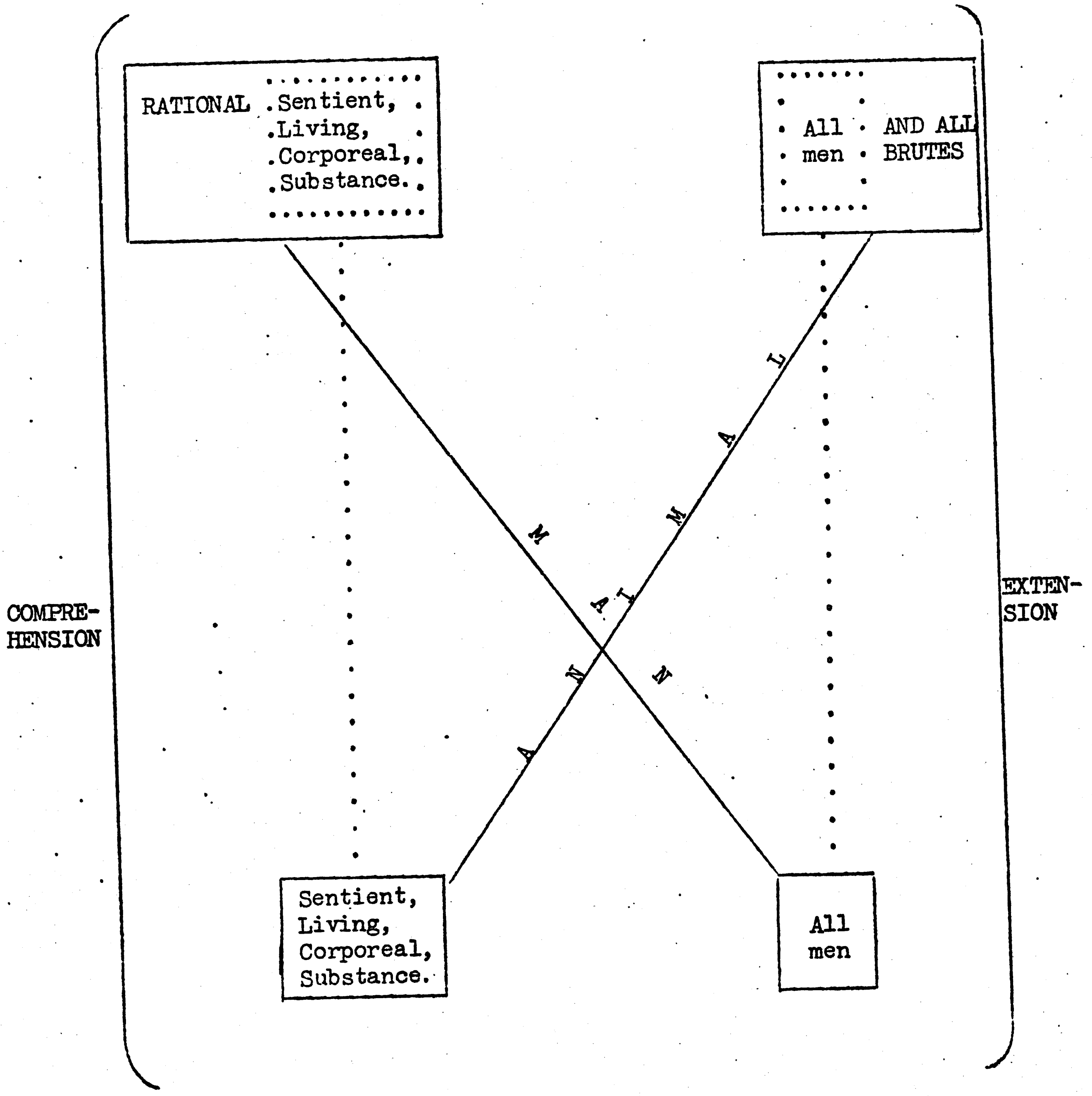
a2. Or LOGICAL WHOLE, because it is implied by, or inferred from, its parts (inferiors), as from this that something is a man it is implied or inferred that it is an animal.

b. Inferior concepts are SUBJECTIVE PARTS or subjects whereof the superior or whole is predicated.

41. GENERAL LAW OF EXTENSION AND COMPREHENSION: This law is the following: CONCEPTS SO HAVE THEMSELVES TOWARDS EACH OTHER THAT SO FAR FORTH AS EXTENSION IS GREATER, THUS FAR FORTH IS COMPREHENSION LESS, AND VICE VERSA.

A. This law follows immediately from the notions of comprehension and extension set out above.

B. This law may be thus illustrated by example, schematically:-



42. SCHEMATIC SUMMARY: What has been said in the fore-going article may be thus schematically recapitulated:-

- Comprehension and extension:
  - NATURE OF
    - COMPREHENSION
      - Its notion: THE COMPLEX OF THE NOTES WHICH CONSTITUTE A CONCEPT.
      - This notion is to be understood:
        - OBJECTIVELY.
        - Not subjectively, as it is taken
          - By Keynes.
          - By Goblot.
    - EXTENSION
      - Its notion: THE MULTITUDE OF SUBJECTS TO WHICH THE CONCEPT BEFITS OR WHEREOF IT EXPRESSES THE NATURE.
      - As it is greater or less, characterizes a concept as
        - SUPERIOR: a Superior concept being
          - A POTENTIAL WHOLE.
          - Or LOGICAL WHOLE.
        - Or INFERIOR: an inferior concept being a subjective part.
  - COROLLARY: Their general law: SO FAR FORTH AS COMPREHENSION IS GREATER, THUS FAR FORTH IS EXTENSION LESS, AND VICE VERSA.

……………………………………………

ARTICLE THREE

DETERMINATION OF THE NATURE OF A CONCEPT.

43. CONCLUSION: The solution of the question regarding the nature of a concept is, as will appear from what will be said hereunder (nn.44-46), the following: THE NATURE OF A CONCEPT IS DETERMINED BY OR TAKEN FROM ITS COMPREHENSION; BUT FROM ITS EXTENSION ARE TAKEN ITS PROPERTIES.

44. DOCTRINE OF MANY MODERN WRITERS: According to many modern authors, who are infected with nominalism, the nature of a concept is determined by its extension.

A. For they consider only individuals.

B. They understand comprehension subjectively, i.e. insofar as it is the complex of the notes whereby a concept is constituted for us, not in itself. For which reason they conclude that the comprehension cannot determine the nature of a concept.

45. THE NATURE OF A CONCEPT IS TAKEN FROM ITS COMPREHENSION: On the contrary, it must be said that the nature of a concept is taken from its comprehension.

A. This is evident, if it is admitted that the comprehension expresses the essence of a thing, not a collection of individuals.

B. Comprehension must be taken, as said above (n.39), objectively, i.e. it must be taken as expressing the complex of the notes whereby the concept is constituted in itself.

C. Therefore the comprehension of a concept expresses primarily the essence, secondarily the properties of a thing:

a. For a property, as will be said below, flows necessarily from the essence.

b. However, in inductive sciences:

b1. the essence of a thing is not known directly,

b2. but only the empiriological properties which the descriptive definition expresses.

46. EXTENSION IS A CERTAIN LOGICAL PROPERTY OF A CONCEPT: Therefore the extension of a concept is a certain logical PROPERTY which a nature obtains in the mind.

A. A concept has a nature (comprehension) which is participable by an infinite multitude of individuals: and herein lies its extension.

B. This property befits it from the ideal existence which the nature has in the mind.

C. Whereupon Maritain well writes:

a. "It is important that the notion of extension and comprehension be firmly established from the very beginning, for any taint of nominalism will prevent it from being rightly understood. In nominalism the concept has no reality other than that of the individuals which it represents. Its essential and original character as a concept is accordingly derived from its extension, that is, from the extent of its universality, or its applicability to a greater or lesser group of individuals. However, if it is true that a concept presents an essence, nature, or quiddity immediately to the mind, and that this essence is something real, then it must be said that the concept as such is essentially and originally characterized by its comprehension, that is to say by the sum of the constitutive notes of the nature that it presents to the mind. Thus the extension of the concept is nothing more than a property following inevitably upon abstraction, and presupposing the comprehension of the concept; in other words, the concept is universal only because it reveals (clearly or obscurely) the necessary constitution of some essence............

b. "The extension of a concept is a logical property that A NATURE has in our mind. The extension of a concept includes both the individuals and the objective concepts (universal but of less extension than itself) in which it is realized. For example, both the concept 'man' and the concept 'beast' are contained in the extension of the concept 'animal', and consequently 'this man, that man, this horse, this butterfly etc' are also and by that very fact contained in the extension of the concept. A concept's extension includes an infinite multitude of individuals (for there is an infinity of possible human beings and beasts). Therefore extension is measured not by the greater or lesser number, but rather by the greater or lesser (infinite) multitude of individuals to which a concept applies. This alone suffices to show that a universal concept is anything but a collection of individuals: it applies to an infinite multitude because it is originally one (in the mind). That which it presents immediately to the mind is not a collection or series of individuals, but the nature realized in each one of them.

c. "We have said that the extension of a concept presupposes its comprehension. Therefore, to consider a concept as to its 'extension' does not mean to abstract from its comprehension, nor to look upon it as a mere collection of individuals - that would simply amount to destroying it as a concept. To consider 'man' as to its extension is to consider this object of thought in relation to the multitude of individuals to which it applies, but it is also to consider it as having a certain characteristic comprehension and as being one in the mind, that is, as being something other than the multitude of individuals in which it is realized.

d. "Nominalism tends to confound the extension of the concept with its resolution into a simple collection of individuals, and thus completely vitiates the notion of extension." (Maritain: Introduction to Logic, pp. 22-28).

47. SCHEMATIC SUMMARY: What has been said in the present article may be thus schematically recapitulated:-

- Determination of the nature of a concept:
  - According to many modern authors: the nature of a concept is determined by its extension:
    - For they consider only individuals.
    - And they understand comprehension subjectively.
  - But it must be said:
    - That the nature of a concept is determined by its comprehension:
      - Because the comprehension expresses the essence of a thing.
      - Therefore comprehension must be taken objectively.
      - Therefore comprehension expresses:
        - Primarily the ESSENCE of a thing.
        - Secondarily the PROPERTIES of the thing.
    - That the extension of a concept is nothing but a certain logical property which a nature obtains in the mind:
      - Inasmuch as the concept has a nature (comprehension) which is participable by an infinite multitude of individuals: wherein lies its extension.
      - This property befits a concept from the ideal existence which the nature has in the mind.

……

ARTICLE FOUR.

DIVISION OF CONCEPTS.

48. FOUNDATION OF DIVISION, AND ORDER OF PROCEDURE: In a concept:

A. Are to be considered:
a. These two:
a1. The nature represented by the concept;
a2. The mode according to which the nature known by the concept is apprehended.
b. Whence the FOUNDATION of the general division of concepts.

B. Now:
a. The former division, which is called MATERIAL - because the nature represented is the matter of the concept - is the same as the division of natures. This division will be dealt with later when it will be question of the ten predicaments.
b. But the latter division, which is called FORMAL - because the manner in which the nature is represented by the concept formally determines the concept - will be dealt with here.

C. Concepts are DIVERSELY divided on the score of their mode of signifying or of representing:
a. On the score of comprehension: which is the ESSENTIAL division, as is self-evident. (n.49).

b. On the score of extension: which division is on the score of their PROPERTY. (n.50).
c. On the score of perfection. (n.51).
d. On the score of origin. (n.52).
e. On the score of end. (n.53).

49. ESSENTIAL DIVISION OR DIVISION ON THE SCORE OF COMPREHENSION: This division is explained as follows:

A. Let us take the concepts 'man', 'white man', 'dog', 'philosopher', 'musician'. These concepts differ by reason of comprehension.

a. 'Man' and 'dog' represent ONE ESSENCE only.
a1. Note the words 'one essence', not 'one note', for the comprehension of 'man' and of 'dog' consists of several notes.
a2. These concepts are called SIMPLE or INCOMPLEX, inasmuch as they represent ONE ESSENCE only.

b. 'White man', 'philosopher', 'musician', on the contrary, represent SEVERAL ESSENCES:
b1. And indeed:
b1a. The first, to wit, 'white man' explicitly represents several essences, namely 'human nature' and 'whiteness'.
b1b. The others, to wit, 'philosopher' and 'musician' implicitly represent several essences, for they signify 'man endowed with philosophical science or musical art'.
b2. Such concepts are called COMPOSITE or COMPLEX, inasmuch as they express SEVERAL ESSENCES.

b. Let us again consider a simple concept, v.g. 'man'. It can be proposed under another form, to wit, the concept of 'humanity'.

a. Humanity expresses the same essence as man, but otherwise.
a1. For:
a1a. Whereas 'man' expresses a subject endowed with human nature,
a1b. 'Humanity' expresses this human nature nudely, WITHOUT SUBJECT.
a2. And so:
a2a. 'Man' is a CONCRETE CONCEPT, i.e. a concept signifying that which is, or a SUBJECT HAVING SUCH A NATURE.
a2b. 'Humanity' is an ABSTRACT CONCEPT, i.e. a concept signifying:
a2b1. not that which is,
a2b2. but that whereby it is, to wit, the NATURE WHEREBY (man) IS THAT WHICH HE IS.

b. With regard to this distinction, NOTE:
b1. That both concrete and abstract concepts are ABSTRACT:
b1a. In that both are derived from sensible experience by the intellectual operation called abstraction:
b1b. And in that both abstract from the individual notes of the intuitively perceived sense objects.
b2. Nevertheless:
b2a. Concepts such as 'humanity', which signify, not that which is, but the nature whereby it is what it is, are abstract to the second power, since they abstract a form from its subject in order to consider it by itself.
b2b. Only in contrast with this sort of abstraction are concepts such as 'man' called CONCRETE.

c. "Concrete' is not to be confused with 'individual':
c1. A concrete concept can indeed be singular, inasmuch as it represents an individual subject, but it is not necessarily so.
c2. Indeed, in the example given, 'man' signifies a subject, but a universal subject, to wit, a subject which abstracts from all individual characteristics.
c3. Accordingly:
c3a. Whereas a concrete concept signifies a form or nature IN A SUBJECT,
c3b. An individual or singular concept signifies a form or nature

IN ONE SINGLE INDIVIDUAL DETERMINATE SUBJECT: such is the concept 'this man' or 'Napoleon Bonaparte'.

C. Let us consider further a concrete concept, v.g. 'man', 'philosopher', 'musician'.

a. These do not have themselves in the same way:
a1. For:
a1a. Whereas 'man' signifies ONLY a subject having human nature;
a1b. 'Philosopher' and 'musician' signify:
a1b1. PRINCIPALLY and DIRECTLY (in recto) philosophic or musical science,
a1b2. and SECONDARILY and INDIRECTLY (in obliquo) men endowed with these sciences.
a2. Accordingly:
a2a. A concrete concept having a single significate is called an ABSOLUTE CONCEPT;
a2b. While a concrete concept which adjoins to the principal significate another secondary significate is called a CONNOTATIVE CONCEPT.

b. It is to be observed that an ABSTRACT concept is always absolute. Thus 'whiteness' and 'humanity' are absolute concepts.

50. DIVISION ON THE SCORE OF EXTENSION: This division is made according to the PROPERTY of a concept. (Cf. n.46).

A. The concepts 'man', 'white man', 'dog', 'philosopher', and 'musician', are extended to many or several individuals. Accordingly they are called UNIVERSAL CONCEPTS. But not all universal concepts are in the same way universal. For the concepts 'man' and 'philosopher' do not have themselves in the same way relatively to individuals as the concepts 'family', army', 'nation'.

a. Concepts such as 'man' and 'philosopher' express a nature common to many, but which befits EACH individual of the many. Thus human nature befits not only all men but each man. Such concepts are called DISTRIBUTIVE UNIVERSAL CONCEPTS.

b. But it is otherwise for the concepts 'family', 'army' and 'nation'.
b1. For the significate of these concepts befits each family, army or nation, but NOT EACH INDIVIDUAL of the family, army or nation.
b2. In brief, the significate of these concepts befits only the COLLECTION named by these words; and therefore such concepts are called COLLECTIVE UNIVERSAL CONCEPTS.

B. And again if we consider distributive universal concepts:

a. Such as 'man' or 'philosopher', we find that each is said of all the individuals to which it is extended, ON THE SAME SCORE (as having the same significate, or as signifying the same character): 'man' is attributed to Peter, to Paul and to John etc. with the same significate, (signifying the same character), for it bespeaks the human nature of each. These concepts are called UNIVOCAL CONCEPTS.

b. But if, instead of these concepts, we take the concept 'healthy', which indeed befits man, food and colour,
b1. Yet ON A DIVERSE SCORE (as having a diverse significate, as signifying a diverse character), and indeed:
b1a. befitting man as a SUBJECT having health,
b1b. befitting food as a CAUSE of health,
b1c. befitting colour as a SIGN of health.
b2. These concepts are called ANALOGOUS CONCEPTS.

C. Thus far we have spoken of concepts which are simply universal.
a. If, by means of the particle 'some' or of a similar particle (v.g. 'some men', 'some dogs'):
a1. The extension of a universal concept is restricted:
a1a. not indeed to one individual,

a1b. but so that it still NEVERTHELESS BEFITS SEVERAL individuals:
a2. the concept remains:
a2a. universal,
a2b. but not simply universal.
b. It is then called a RESTRICTED UNIVERSAL or PARTICULAR concept.

D. But if instead of the particle 'some' taken plurally (as in 'some men', 'some dogs'):
a. We use:
a1. the particle 'this' or 'that', (as in 'this man', 'that man'),
a2. or the particle 'some' taken singularly (as in 'some man', 'some dog'),
a3. or a proper name, (as Peter or Paul),
b. the concept:
b1. no longer remains universal,
b2. but becomes SINGULAR, inasmuch as its extension is restricted to ONE individual only.

51. DIVISION ON THE SCORE OF PERFECTION: This division, although it is accidental, is of the GREATEST IMPORTANCE, since our knowledge passes through diverse grades, hardly arriving at perfection.

A. The foundation of the diversity of concepts on the score of perfection is found in the manifold manner in which we know what is the thing which we apprehend through a concept.

a. Nevertheless we begin to conceive something concerning some thing before we know what it is, to wit, when we know concerning it only WHAT IT IS NOT.
a1. For this, it suffices that we know something diverse from the thing to be known.
a2. Thus concerning an 'isotope', one might know only that it IS NOT a man.
a3. This concept 'non-man' is called an INFINITE or INDEFINITE CONCEPT.

b. But whenever concerning some thing we know, even most imperfectly, what it is, we have concerning this thing a FINITE CONCEPT. Of the finite concept alone is it question here.

B. Let us return to the examples given above.

a. The concepts:
a1. 'Man', 'philosopher', 'musician', designate determinate essences; they suffice to distinguish those essences from ALL OTHER essences.
a2. On the contrary, the concept 'animal':
a2a. suffices indeed to distinguish animal from plant and mineral,
a2b. but not to distinguish man (rational animal) from brute (irrational animal).

b. Accordingly:
b1. The former concepts befit only ONE essence (simple or composite);
b2. The last befits SEVERAL essences (note that we say "essences", not "individuals").

c. Hence:
c1. The last (animal) is called a COMMON or OBSCURE CONCEPT, according as it is common to SEVERAL essences, without distinguishing one from another.
c2. The former (man, or philosopher, or musician), which befits ONE essence only, is called a PROPER or CLEAR CONCEPT.

C. But not in the same way do a child and a philosopher conceive man.

a. A child conceives man through external forms, i.e. through a sum of accidents, such as "two-legged", "featherless", "upright", "walking", "emitting talk-sounds", "emitting laughter-sounds", "emitting weeping-sounds", "having an expressionful face", "subject to anger", "subject to joy", etc.

a1. Which external forms or accidents:
a1a. taken separately, befit several things (essences), as:
a1a1. 'two-legged' befits man and bird;
a1a2. 'featherless' befits man and horse;
a1a3. 'upright' befits man and kangaroo;
a1a4. 'walking' befits man and rooster;
a1a5. 'emitting talk-sounds' befits man and parrot;
a1a6. 'emitting laughter-sounds' befits man and kookaburra;
a1a7. 'emitting weeping-sounds' befits man and hyena;
a1a8. 'having expressionful face' befits man and monkey;
a1a9. 'subject to anger' befits man and cat;
a1a10. 'subject to joy' befits man and dog;
a1b. but taken together befit man alone.
a2. Such a concept is called CONFUSED or NON-QUIDDITATIVE, inasmuch as it does not express the essential notes of the concept.

b. But a philosopher conceives man as 'rational animal':
b1. These notes display the essential predicates of man.
b2. Such a concept is called DISTINCT or QUIDDITATIVE.

D. A philosopher conceives man as a rational, sensitive, living, corporeal substance.

a. Therefore this quidditative concept of man as he is known by the philosopher:
a1. Expresses all the essential notes of man.
a2. Wherefore it is called a COMPLETE concept.

b. But of man alone among substances has a philosopher such a concept:
b1. For of other substances, such as 'dog' and 'rabbit', he is ignorant of the specific difference.
b2. In such cases the concept is called INCOMPLETE.

E. With an incomplete concept is not to be confused a concept, complete indeed, but NOT STRICTLY QUIDDITATIVE, in which all the essential predicates are known, not however positively, but in a POSITIVO-NEGATIVE way.

a. Thus it is with the concept which a philosopher has of a brute.
a1. He knows all its essential notes indeed;
a2. Yet one of them, to wit, its specific difference (which he knows as 'irrational), he knows positivo-negatively only.
b. This concept of 'irrationality' is called positivo-negative:
b1. For it positively signifies what rationality is,
b2. And adds thereto a negation.

F. Although a strictly quidditative concept expresses quidditatively the whole thing, yet it may not totally display its notes, i.e. in not exhausting the whole knowability of the thing.

a. Indeed:
a1. Of no thing has man such a COMPREHENSIVE concept.
a2. God alone knows HIMSELF AND ALL THINGS comprehensively.
a3. An angel knows HIMSELF comprehensively.

b. But men, even by their most perfect concepts, know only APPREHENSIVELY, i.e. not totally.

52. DIVISION ON THE SCORE OF ORIGIN: The question of the origin of our concepts has been already briefly touched above; for it has been said that they are obtained by means of abstraction (nn.27-30).

A. Therefore it must be said:
a. That all our concepts are ABSTRACTIVE, i.e. formed:
a1. not from the physical presence of the thing,
a2. but from its merely mental (intentional) presence.
b. Otherwise INTUITIVE knowledge would be had.
c. But in human knowledge, the only intuition in the proper sense of the word is found in the external senses, and sensitive consciousness.

B. *Note* the qualification "*in the proper sense* of the word": for besides this meaning, the terms "intuition" and "intuitive" are used in diverse, but less strict, ways.

a. Sometimes these terms are used to designate our *singular* concepts of a thing PHYSICALLY present.

a1. For since, as is shown in psychology, our intellect knows the material singular only reflexively, by converting itself back over sensitive knowledge, in this reflexion the intellect is indeed borne upon the singular thing, but this concept is not of a thing *physically* present to the INTELLECT, and therefore such a concept does not merit the name 'intuitive', save QUITE IMPROPERLY because the object is not physically present save to the SENSES.

a2. On the contrary, the name 'intuition' may be given to the reflexion of our intellect upon its own acts, in which it experiences not only its own acts, but the very existence of the soul. For this knowledge is terminated indeed at a *concept* (species expressa - expressed type) but it is of a thing physically present to the INTELLECT.

a2a. In this meaning, intuitive concept:

a2a1. Retains what is ESSENTIAL to proper intuition, to wit, the PHYSICAL PRESENCE OF THE THING;

a2a2. But it is deficient in this, that it requires, as is shown in psychology, a *formal concept* (species expressa - expressed type).

b. Sometimes also a concept is called *intuitive*, to signify an immediate concept:

b1. And thus:

b1a. 'Intuitive' signifies a concept obtained WITHOUT DEMONSTRATION,

b1b. And it is opposed to a *mediate* concept, or a concept obtained by the aid of demonstration.

b2. In this acceptation:

b2a. '*Intuitive concept*' is not at all opposed to '*abstractive* concept';

b2b. And so some authors, such as *Garrigou-Lagrange* and *Maritain*, can rightly speak of an '*abstractive intuition*' of our intellect.

C. Hence the acceptations of the terms 'intuition' and 'intuitive' may be thus schematically exhibited:-

The name 'intuition' or 'intuitive' is given

- QUITE PROPERLY to no natural human knowledge save that of the *external senses* (and sensitive consciousness - sensus communis).
- LESS PROPERLY
  - to the *reflexion* of our intellect over its own acts, whereby it experiences
    - The term of its own acts (its concepts).
    - Its own acts.
    - Itself (the *intellect*).
    - The *existence of the soul*.
  - to our *immediate* concepts.
- QUITE IMPROPERLY to our *singular* concepts.

53. DIVISION ON THE SCORE OF END: The end of knowledge or of science can be *twofold*:

A. For we may know:

a. For the sake of *knowing*;

b. Or for the sake of a *work*.

B. Therefore concept is distinguished into:

a. SPECULATIVE concept, which contemplates a thing in order to stay in this contemplation.

b. PRACTICAL concept, which likewise contemplates a thing, but for the direction of a work.

54. SCHEMATIC SUMMARY: The fore-going divisions of the concept may be thus schematically summarized:-

Divisions of concept:

- By reason of ITSELF
  - ESSENTIAL DIVISION (on score of *comprehension*)
    - COMPLEX (composite).
    - SIMPLE (incomplex)
      - CONCRETE
        - ABSOLUTE.
        - CONNOTATIVE.
      - ABSTRACT
  - ACCIDENTAL DIVISIONS:
    - On score of *property (extension)*
      - UNIVERSAL
        - *Simply*
          - COLLECTIVE.
          - DISTRIBUTIVE.
        - PARTICULAR
          - COLLECTIVE
          - DISTRIBUTIVE.
      - SINGULAR
        - COLLECTIVE.
        - SINGULAR.
    - On score of *perfection*
      - INFINITE (indefinite).
      - FINITE
        - COMMON, OBSCURE.
        - PROPER, CLEAR
          - QUIDDITATIVE (DISTINCT)
            - *Strictly*
              - APPREHENSIVE.
              - COMPREHENSIVE.
            - *Non-strictly*.
          - NON-QUIDDITATIVE (CONFUSED).
- By reason of its CAUSES:
  - On Score of *origin*
    - INTUITIVE.
    - ABSTRACTIVE.
  - On score of *end*
    - SPECULATIVE.
    - PRACTICAL.

……

ARTICLE FIVE.

RELATIONS OF CONCEPTS TO EACH OTHER.

55. ORDER OF PROCEDURE: Thus far we have spoken of concepts in themselves. Now we come to speak of the relations which they may have to each other.

56. IDENTICAL AND DIVERSE CONCEPTS: The relation of two or more concepts to each other is obtained by comparison of their comprehensions and extensions.

A. If several concepts, signifying the same, have THE SAME comprehension and extension, they are STRICTLY IDENTICAL. This is so with 'man' and 'rational animal'.

B. But another verdict is to be given, if, signifying the same, they have THE SAME extensions only, their comprehensions being diverse.
a. This is so with:
a1. '(4 x 16)' and 'the square of 8';
a2. 'Equilateral triangle' and 'equiangular triangle'.
a3. 'Rational animal' and 'unfeathered biped'.
b. Such concepts are called EQUIPOLLENT.

C. If they have diverse significates, concepts are called DIVERSE. Thus, diverse are these concepts:
a. 'Man' and 'horse'.
b. 'Animal' and 'man'.
c. 'Blind' and 'seeing'.
d. 'White' and 'scholarly'.

57. DIVERSE MODES OF DIVERSITY OF CONCEPTS: But these concepts are in diverse ways diverse:

A. 'White' and 'scholarly' are diverse:
a. in such wise that:
a1. NEITHER does one infer the other,
a2. NOR does one exclude the other.
b. In other words, they have NO relation or connexion between them.
c. In such case, concepts are called IMPERTINENT.

B. But 'animal' and 'man' have relation between them. For there is inclusion of one by the other. They are said to be PERTINENT BY SEQUEL.

a. However, 'man' includes 'animal' in such wise as not to be included in 'animal'.
a1. Accordingly:
a1a. The concept which is included ('animal') is called SUPERIOR;
a1b. The concept which includes ('man') is called INFERIOR.
a2. In such case, concepts are called UNEQUAL or NON-CONVERTIBLE.

b. But inclusion may be mutual.
b1. Thus 'rational' and 'risible':
b1a. being diverse concepts,
b1b. and pertinent by sequel,
b1c. MUTUALLY include each other.
b2. In such case, concepts are called EQUAL or CONVERTIBLE.

C. It is otherwise:

a. Between:
a1. 'Man' and 'horse';
a2. 'Man' and 'non-man';
a3. 'Blind' and 'seeing';
a4. 'Blue' and 'red';
a5. 'Father' and 'son'.

b. For:
b1. They EXCLUDE EACH OTHER;
b1a. And for this reason are called PERTINENT BY REPUGNANCE or OPPOSITE.
b1b. For OPPOSITES are: Those things which cannot be together in the same thing under the same respect.
b2. Yet not in the same way are they pertinent by repugnance or opposite.

c. 'Man' and 'horse' are said to be IMPROPERLY OPPOSITE or DISPARATE concepts: because:
c1. IMPROPERLY OPPOSED are: Those things which, as opposed and repugnant, have not reference to each other in any special way: as 'virtue' and 'stone'.
c2. And:
c2a. These concepts, to wit 'man' and 'horse', express things utterly diverse without any reference to each other.
c2b. Note here the word "things" (not concepts) without any reference: for they exclude each other.

d. But the other concepts, in the examples given, are PROPERLY OPPOSITE:
d1. Because:
d1a. PROPERLY OPPOSED are: Those things which, as opposed and repugnant, have reference to each other in a special way: as 'virtue' and 'vice'.
d1b. And the things represented by those concepts have some relation to each other.
d2. But diversely are they related to each other:
d2a. 'Man' and 'non-man' exclude each other CONTRADICTORILY:
d2a1. Because one simply posits what the other removes or negates;
d2a2. So that there is no medium between them.
d2a3. Hence they are called CONTRADICTORY concepts.
d2b. 'Blind' and 'seeing' have PRIVATIVE exclusion of one for the other:
d2b1. Because one posits what the other removes in a subject apt to have it;
d2b2. So that there is between them a negative medium only, to wit, 'sightless' (as a tree is sightless, - neither seeing nor blind).
d2b3. Hence they are called concepts PRIVATIVELY OPPOSITE.
d2c. 'Blue' and 'red' exclude each other CONTRARILY:
d2c1. Because one not only removes the other, but posits something positive which is exclusive of the other.
d2c2. So that between them there is a positive medium, to wit, the intermediary colours, such as purple: and as between prodigality and avarice there is reasonable thriftiness; and as between rashness and cowardice there is bravery.
d2c3. Hence they are called CONTRARY concepts.
d2d. 'Father' and 'son' are opposed RELATIVELY.
d2d1. Because they bespeak such an order to each other that one cannot be understood without the other.
d2d2. Hence they are called concepts RELATIVELY OPPOSITE.

58. SCHEMATIC SUMMARY: What has been said in the fore-going article regarding the relations of concepts to each other may be thus schematically recapitulated:-

On concepts as related to each other: they are
- Either IDENTICAL: and then
  - Either STRICTLY IDENTICAL.
  - Or EQUIPOLLENT.
- Or DIVERSE: and then
  - Either IMPERTINENT.
  - Or PERTINENT: and then
    - Either BY SEQUEL: and then
      - Either CONVERTIBLE.
      - Or NON-CONVERTIBLE: and then
        - As SUPERIOR.
        - And INFERIOR.
    - Or BY REPUGNANCE: and then
      - Either by PROPER REPUGNANCE: and then
        - Either as a positive and a negative: and then
          - Either CONTRADICTORY.
          - Or PRIVATIVE.
        - Or as two positives: and then
          - Either CONTRARY.
          - Or RELATIVE.
      - Or by IMPROPER REPUGNANCE: DISPARATE.

……………………………………………

CHAPTER FOUR.

……………

THE SIGN OF THE CONCEPT, OR TERM.

……………………………

59. ORDER OF PROCEDURE: This consideration of the term, which is the sign of the concept:

A. Will treat:

a. First, of the necessity of terms or of language.

b. Secondly, of the nature of terms: but since the understanding of the nature of terms pre-requires the understanding of the nature of sign, this treatment of the nature of the term will deal:

b1. In the first place, with the term as a sign;

b2. In the second place, with the nature of the term: which treatment will be twofold, to wit:

b2a. On the notion of terms;

b2b. On the division of terms.

c. Thirdly, of the properties of the term: but since one of these properties, to wit, supposition, is of chief importance, this consideration of the properties of the term will consider:

c1. In the first place, supposition.

c2. In the second place, the other properties of the term.

B. Hence the following order:-

On the term:
- Necessity of terms or of language................Article one.
- Nature of terms
  - The term as a sign......................Article two.
  - Nature of term
    - Notion of terms.................Article three.
    - Division of terms...............Article four.
- Properties of terms
  - Supposition..................Article five.
  - Other properties............Article six.

……

ARTICLE ONE.

NECESSITY OF MANIFESTING CONCEPTS BY SENSIBLE VOCABLES.

60. FACT OF SPEECH: That man uses sensible vocables, or speaks, (and writes), is evident from experience.

61. NECESSITY OF SPEECH: But man uses sensible vocables, or speaks (and writes), as moved by necessity on three heads, to wit:

A. Inasmuch as he is a rational being, man is naturally sociable.

a. For which reason he has a necessity to use sensible vocables to manifest his concepts in order to communicate with others: which is done by speech.

b. As Maritain writes: "Man is naturally a 'social' or 'political' animal; he is made to live in society (this is so........on account of his specific character, a being capable of reasoning, because he cannot make fitting progress in the work of reason except through help and instruction of others). Consequently, the aptitude for acquiring knowledge of things is not enough; he must be able to express his knowledge verbally. From this necessity arose the system of conventional signs, called language, by which men communicate their thought: a wonderful instrument fashioned of articulate sound passing through the air, imparting through the most pliant and subtle of materials our innermost and most spiritual selves." (Maritain: Introd. to Logic, p.45).

c. To quote St. Thomas: "If indeed man were naturally a solitary animal, sufficient for him would be the passions (conceptions) of the mind whereby he would be conformed to things themselves, so as to have knowledge of them in himself; but because man is an animal naturally political and social, it was necessary that the conceptions of one man become known to others, which is done through the voice-sound; and therefore it was necessary that there be significative voice-sounds for this that men might communicate with each other. Wherefore those who are of diverse languages, cannot well communicate with each other." (In I Periherm. lect. 2)

B. Moreover, the universal concept transcends present time.

a. Hence the necessity of using written vocables to ensure that concepts be not lost through oblivion.

b. As Maritain explains: "Because man, unlike the animal, is not riveted to the present moment, it is fitting that he should make his thought known to those distant from him in time or space; hence the necessity for a second system of signs, more material and less perfect than the first, which it represents, and this system is called writing." (Maritain: op. cit. p.45).

c. To cite St. Thomas again: "Again, if man employed sensitive knowledge alone, which concerns the 'here and now', sufficient for him would be the significative voice-sound, just as it is sufficient for the other animals, which through certain voice sounds manifest their conceptions to each other. But because man employs also intellectual knowledge, which abstracts from here and now, he carries with him a solicitude, not only about things present according to place and time, but also about those which are distant in place and future in time. Wherefore, that man manifest his conceptions also to those who are distant according to place, and to those who are to come in future time, the use of writing was necessary to him." (In I Periherm. lect. 2).

C. Lastly, all the knowledge entertained by men begins from the senses.

a. And therefore every sensible vocable, by its nature, helps or facilitates the thought of man.

b. As Maritain says: "Language and writing (oral and written signs) are essentially destined to the social manifestation of thought. However, because our sentient nature is ever in search of material support, these systems of signs offer to thought as their secondary effect the valuable assistance of precision, stability and economy of effort. But we must beware of thinking that these material signs are absolutely necessary to thought, that they could ever represent it as perfectly as a tracing, or that they could ever act as its substitute and replace it." (Maritain: op. cit. p.46).

……………………………………

ARTICLE TWO.

SENSIBLE VOCABLES AS SIGNS OF THOUGHTS.

62. SENSIBLE VOCABLES ARE SIGNS OF CONCEPTS: The office of sensible vocables or voice-sounds in the manifestation of thoughts is the same as the office of smoke manifesting fire.

A. Just as:

a. Smoke represents to one seeing it another than itself (to wit, fire) and testifies to the existence of fire,

b. So a sensible voice-sound, perceived by a hearer, leads his mind to knowledge of the concept whereof it holds the stead, (i.e. whereof it is vicarious).

B. But "THAT WHICH REPRESENTS TO A COGNOSCITIVE POWER SOMETHING OTHER THAN ITSELF, AS HOLDING THE STEAD THEREOF" is called a SIGN. (Cf. John of St. Thomas, Cursus Philosophicus: Logica, P.I, c.2, ed. Reiser, p.9; cf. ibid. p.646).

C. Therefore the sensible voice-sounds, whereby man externally manifests his concepts, are signs of concepts.

63. HOW SIGNS MANIFEST ANOTHER THAN THEMSELVES: But, in order that the nature of the signs of concepts may the better appear, we must consider how signs manifest something other than themselves.

A. Smoke manifests fire, by the medium of a previous knowledge of itself:

a. That is, the sign (smoke) and the signed (fire) are known by a twofold knowledge as it were by passing from one to the other ("quasi discurrendo": QQ Disp. de Verit. q9, a.4, ad 4).

b. Such a sign, that to wit, whereby the signed is known by the medium of a previous knowledge of the sign, is called an INSTRUMENTAL SIGN.

B. Speaking above (n.34) of the formal concept, we said that it represents the nature of an external thing. Like smoke, it manifests another than itself. It is accordingly a sign of the nature of an external thing.

a. But because the essence of the formal concept is identical with the nature of the external thing (n.34), the formal concept manifests the nature of the external thing (the signed), not by a twofold act, nor "as it were by passing from one to the other", but by a single act.

a1. BY THE SAME ACT whereby is known the essence of the formal concept, is known the nature of the external thing, ON ACCOUNT OF THE IDENTITY OF THE TWO.

a2. Such a sign, to wit, whereby the signed is immediately known IN THE SIGN, is called a FORMAL SIGN.

a3. In regard to which may be noted the following from St.Thomas: "It is different to know something IN SOMETHING and to know something FROM SOMETHING:

a3a. "For when something is known IN SOMETHING, it (knowledge) is borne by one movement to both.........and such knowledge is not discursive..........

a3b. "But then is something said to be known FROM SOMETHING, when it is not the same movement to both, but first the intellect is moved to one, and FROM this is moved to the other: wherefore here there is a certain discursus." (QQ Disp. de Verit. q5, a.15).

b. The foundation of the diversity between instrumental sign and formal sign lies in this, that whereas:

b1. In the FORMAL sign there is IDENTITY:

b1a. not indeed of the sign and the signed (for in that case, there would be no representing of another than self),

b1b. but of the essence of the sign and of the signed.

b2. In the INSTRUMENTAL sign there is DIVERSITY.

c. Therefore:

c1. Not rightly speak those, such as Goudin, Zigliara, and Pirotta, who think:

c1a. That similitude of sign and signed suffices for the formal concept;

c1b. And say that:

c1b1. not only the concept,

c1b2. but also a picture and a statue, are formal signs.

c2. In truth:

c2a. This similitude does not suffice,

c2b. But the similitude must be so perfect between the sign and the signed:

c2b1. that:

c2b1a. the essence of the sign IS IDENTICAL with the signed, the two differing on the point of existence alone;

c2b1b. And therefore the formal concept alone is a formal sign.

c2b2. Which is the teaching of John of St.Thomas, Gredt, Maritain, etc. (Cf. Blanche, Bulletin Thomiste, nov. 1925, pp.3-4; Goudin, Logica Minor, I, q.I, a.I, I; Zigliara, Dialectica, tom. 1, cap. I, 2; Pirotta, Summa Phil. vol.I, p.24, n.33, 1: Gredt, Philos. Arist. Thom., I, 1, n.9; Maritain, Les Degres du Savoir, annexe I, pp.769 ss.)

C. Therefore in the formal sign there is always present a REAL NEXUS between the sign and the signed: to wit, identity between the essence of the sign and of the signed, and consequently a real relation of similitude between the sign and the signed. But in an instrumental sign the sign and the signed have themselves otherwise.

a. In the sign 'smoke' indeed, there is a real nexus between the smoke and the fire, which real nexus is a relation of effect to cause.

a1. For which reason smoke is said to be a natural sign of fire.
a2. Similarly, by reason of real similitude, between a statue and him whose image it is.

b. But there are other instrumental signs. For example, to find an unknown person in a crowd, the holding in his right-hand of a newspaper, or his standing bare-headed beneath a clock, may be determined by AGREEMENT as a sign of him.
b1. In this case, the relation between the sign and the signed is a merely MENTAL relation (relatio rationis).
b2. Then we have a CONVENTIONAL sign, or ARBITRARY sign, or sign 'ad placitum'.
b3. The oral or written vocables whereby thoughts are manifested are CONVENTIONAL INSTRUMENTAL SIGNS.

....

ARTICLE THREE.

THE NOTION OF TERMS.

64. DEFINITION OF TERM: Under the designation 'terms' are understood nothing else than the signs of concepts.

A. Therefore TERM is DEFINED: "A VOCABLE CONVENTIONALLY SIGNIFICATIVE - VOX SIGNIFICATIVA AD PLACITUM". (Cf. Periherm. I, c2; c.4).

B. For a right understanding of this definition, it is to be noted:

a. That "vocables signify the conceptions of intellect IMMEDIATELY, and, by the medium of them, things." (In I Periherm, lect.2).
a1. For if names immediately signified things:
a1a. Neither would there be any false names;
a1b. Nor would there be any equivocal terms.
a2. Thus Maritain writes: "The term signifies simultaneously and in the same act both the concept and the thing, but it immediately signifies the concept (the mental concept or sign of the thing, and the objective concept, or the thing as object presented to the mind) and only signifies mediately the thing itself (as it exists outside the mind) by means of the concept: 'vocables signify the conceptions of intellect immediately, and by the medium of them, things;' 'names do not signify things save by the medium of intellect.' For:
a2a. "We intend to have our words impart 'what we are thinking about things', that is - our concepts;
a2b. "The word 'man', for example, signifies human nature, abstracting from individual human beings, but human nature thus abstracted exists only in our apprehension or in our concept, not in the real;
a2c. "What we say signifies either the true or the false, but truth or falsity exists only in our concepts, not in things themselves;
a2d. "If words themselves signified things directly there would be no equivocal terms." (Maritain: Introd. to Logic, p.47).

b. The terms signify MORE IMMEDIATELY formal concepts, but MORE PRINCIPALLY objective concepts:
b1. That more immediately they signify formal concepts, is clear from this, that vocables immediately signify the conceptions of intellect: but objective concepts are identified with the thing.
b2. That more principally they signify objective concepts, is clear from this, that the formal concept is not that which we know, but that wherein we immediately know things.

....

ARTICLE FOUR.

DIVISION OF TERMS.

65. DIVISION OF TERMS IN THEMSELVES: Since terms are signs of concepts, terms in themselves are divided in the same way as are concepts themselves. Therefore there would be no further question, in addition to what has been said regarding the division of concepts above, were it not that terms, like concepts, are ordered to the formation of signs of the work or product of the second and third operation of the mind, which signs are propositions and argumentations.

66. DIVISION OF TERMS AS PARTS OF A PROPOSITION: The division of terms as they are parts of a proposition is unfolded as follows:

A. Let us take this proposition: "This helpless child and that powerful man are truly companions in sorrow."

a. In this proposition:
a1. Are to be distinguished:
a1a. Two demonstrative adjectives: 'this', 'that'.
a1b. Four substantives: 'child', 'man', 'companions', 'sorrow'.
a1c. Two adjectives: 'helpless', 'powerful'.
a1d. One conjunction: 'and'.
a1e. One proposition: 'in'.
a1f. One copula: 'are'.
a1g. One adverb: 'truly'.
a2. But in the proposition these terms have not the same office.

b. On the one hand:
b1. The adjectives, conjunction, preposition, adverb, and even one of the substantives (which is in an oblique case), to wit, 'sorrow', have in the proposition no other office than that of modifying and determining the other substantives, to wit: 'child', 'man', 'companions'.
b1a. 'This' narrows the extension of the term 'child'; 'that' likewise narrows the extension of the term 'man'.
b1b. 'Helpless' similarly restricts the term 'child', and 'powerful' in like fashion restricts the term 'man'.
b1c. 'And' connects or conjoins the terms 'child' and 'man'.
b1d. 'In sorrow' restricts the term 'companions'.
b1e. 'Truly' determines the signification of the term 'companions' lest it seem to signify a mere metaphor.
b2. TERMS which thus signify something as a modification and determination of another are called SYNCATEGOREMATIC TERMS, or consignificative terms.

c. On the other hand, the three substantives in a direct, or nominative, case ('child', 'man', 'companions') and the copula ('are') signify something which is represented as something by itself (per se).
c1. Such terms are called CATEGOREMATIC TERMS, or significative terms.
c2. But these have:
c2a. Something common;
c2b. Something proper.

B. These substantives are called NOUNS (NAMES).

a. They designate finite concepts; for infinite concepts are signified by means of a noun, the syncategorematic particle 'non' being added. (Cf. n.51.A.).

b. However, not only substantives are nouns (names), but also all categorematic terms which signify things in a permanent or stable way.
b1. Therefore "nouns" here includes:
b1a. Predicative adjectives used as nouns (as in: "The tree is green", where 'green' is a predicative adjective): for such a predicative adjective is a categoreme having the role of stable extreme in a proposition.

b1b. Substantive adjectives used as subject (as in "Green is a colour", where 'green' is a substantive adjective used as a noun): for a substantive adjective used as a noun is a categoreme having the role of stable extreme in a proposition.

b1c. As well as substantives, such as 'child' and 'man'.

b2. Thus in the proposition: "Green is beautiful", both 'green' and 'beautiful' are nouns.

c. But when it is said that a thing is signified by a noun (name) IN A PERMANENT OR STABLE WAY:

c1. This:

c1a. does not affect the thing itself;

c1b. but the way wherein it is signified.

c2. And this mode is based in the very nature or essence of it.

c3. This is explained by Maritain: "The noun is a term that signifies things 'sine tempore'" (without time) "as intemporal. Time is excluded, not from the things that the noun may signify (for there are nouns that denote time), but from the manner in which the noun signifies. For the noun signifies the thing as stable, as having a certain mode of permanence (even if the thing itself is not stable, e.g. 'movement', 'change'; this stability in the noun's mode of signifying does not mean that the thing itself is stable, but means that the noun takes as its foundation in the thing the stability of the essence or nature of this thing. Time is always time; and as long as it exists 'movement' qua movement, immutably keeps its nature, movement).

d. Bergson and Le Roy, on account of the nominalism or idealism which they profess, are precluded from understanding this.

d1. And wrongly therefore do they say that concepts and words break up reality into immobile parts and render reality devoid of movement, thus deforming the real.

d1a. What they say would be true if the mode of permanence or stability affected the thing conceived or signified.

d1b. But since this mode of permanence or stability affects only the noun's way of signifying, what they say is false.

d2. Indeed, further, they forget that:

d2a. If the noun expresses the nature of things,

d2b. There is another categoreme, to wit, the verb, whose office it is, on the contrary, to signify MOVEMENT, - as will be seen shortly.

d2c. Indeed "since language cannot simultaneously express the stability of essences and the flux of movement it puts the burden once and for all upon two terms, the noun to express the former, and the verb to express the latter. Both of these terms accomplish their task by the manner in which they signify each, viz, stability of essences and flux of movement (and not by the things which they signify). Maritain: Introd. to Logic, pp.55-56).

e. From what has been said it is clear that the NOUN is rightly defined by Aristotle:

e1. "A VOCABLE, CONVENTIONALLY SIGNIFICATIVE, WITHOUT TIME, WHEREOF NO PART SEPARATELY SIGNIFIES, FINITE AND DIRECT - VOX SIGNIFICATIVA AD PLACITUM, SINE TEMPORE, CUIUS NULLA PARS SEPARATA SIGNIFICAT, FINITA ET RECTA". (Periherm. I, c2, 16a 19; cf. lect.4 S.Thomae).

e2. But, lest anything still remain obscure in this definition, let the following explanations be noted:

e2a. "A conventionally significative vocable" is the definition of term in common, stating what is common with all terms. (n.64).

e2b. The remaining elements in the definition distinguish the noun from those terms which are not nouns: to wit:

e2b1. "Without time" distinguishes the noun from the verb, which signifies with time.

e2b2. But, as noted above:

e2b2a. From the noun is not excluded time as a thing signified, v.g. as the noun 'day' or 'hour' signifies time.

e2b2b. But what is excluded is signification with time, as a mode of signifying:

e2b2c. Because:

e2bc1. a noun signifies a thing as a standing extreme;

e2b2c2. a verb signifies a thing as flowing or fluent.

e2b2. "Whereof no part separately signifies" distinguishes the noun from a speech (discourse) and from a complex term:

e2b2a. For:

e2b2a1. A speech (v.g. 'A just man pays his debts') is not a noun, but is composed from the noun.

e2b2a2. A complex term (v.g. 'A just man') is not a noun, but is composed from several nouns.

e2b2b. This phrase "no part separately signifies" is to be understood of the part as it exists within the noun, for composite nouns (such as 'pro-consul', 'wage-earner', 'water-pipe'), must be admitted as nouns, for these are true nouns and signify a simple essence, although they are composed of parts which, detached and outside the noun, are significative of themselves.

e2b3. "Finite" excludes infinite terms (v.g. 'non-man': n.51.A); for an infinite term is not a noun (name), because:

e2b3a. Removing the significate of the term ('man'), it does not name or signify something determinate,

e2b3b. But withholds itself from naming;

e2b3c. And though nevertheless it signifies something, this is, so to speak, 'per accidens' or indirectly, or consequently, or mediately.

e2b3d. Note that:

e2b3d1. It is required for the character of an infinite term, that it indetermines or infinitates from an adjoined negation some positive signification.

e2b3d2. Therefore the terms 'none', 'no one', 'nothing', 'non-being' and such like are not infinite terms, because they do not indetermine or infinitate some positive signification by an adjoined negation, but simply signify a negation.

e2b4. "Direct" excludes the oblique cases, (i.e. vocative, genitive, accusative, dative and ablative).

e2b4a. For by declension a noun declines from the proper character of noun; or, in other words, a noun in an oblique case is a noun which falls away (cadit) from the proper character of noun.

e2b4b. So that a noun in an oblique case is signified:

e2b4b1. not "as something, and as a certain extreme in itself".

e2b4b2. but "as of another, respectively to another",

e2b4b3. and therefore is a syncategoreme:

e2b4c. Thus:

e2b4c1. The vocative is either a speech (as when 'Peter!' means 'Pay attention' or something similar) or an interjection.

e2b4c2. The genitive modifies or determines a noun (v.g. 'Peter's book').

e2b4c3. The accusative similarly modifies or determines a noun (v.g. 'Peter loves Mary - Petrus amat Mariam' which is really this: 'Peter is loving of Mary - Petrus est amans Mariae'; in which example 'of Mary - Mariae' modifies or determines the noun 'loving - amans').

e2b4c4. The dative similarly modifies or determines a noun (v.g. 'Peter gives a book to James - Petrus dat librum Jacobo'. which is really this: 'Peter is giving a book to James - Petrus est dans librum Jacobo'; in which example 'to James - Jacobo' modifies or determines the noun 'giving'.

e2b4c5. The ablative similarly modifies or determines a noun (v.g. 'This child and this man are companions in sorrow', in which example 'in sorrow' modifies and determines the noun 'companions').

C. But in this does a VERB principally differ from a noun, that a verb signifies WITH TIME, that is, it signifies action or passion; not "as a certain thing, which can befit a noun" (In I Periherm lect. 5, n.7), as we have noted above against Bergson and Le Roy, but as a MOVEMENT (action) which is measured by time.

a. It is to be noted:

a1. That "in every verb other than the verb 'IS' there is included,

a1a. "the general act, which is 'be',

a1b. "and a special act or the thing of the verb which is bespoken by the participle of that verb;

a2. "and therefore every verb, other than 'is',

a2a. "is resolved by:

a2a1. "'is',

a2a2. "and 'its participle';

a2b. "as 'runs', that is, 'is running'." (Expositor Logicae P. Hisp. Tract.I, De verbo, 3a Decl.)

b. The verb 'is' always signifies *existence*, but diversely:

b1. For if we say: 'Paul IS', that is, whenever *existence* is predicated of the subject, the verb 'is' signifies *actual* existence.

b2. On the contrary, when 'is' is taken as a copula which mediates between the subject and the predicate, it signifies *actual* existence or *possible* existence, *real* existence or *ideal* existence. Thus, for example:

b2a. '*Peter is a musician*': here 'is' signifies *real actual* existence.

b2b. '*Man is a rational animal*': here 'is' signifies *real possible* existence.

b2c. '*Animal is a genus*': here 'is' signifies *ideal possible* existence.

b2d. '*Paul is the subject of the proposition*': here 'is' signifies *ideal actual* existence.

c. *But*:

c1. Since the existence signified by the verb:

c1a. *either itself is predicated* of the subject (then the verb is called a verb-predicate),

c1b. *or* affirms the existence of the *predicate* in the subject,

c2. Therefore it must be rightly said that the verb always holds itself on the side of the predicate, or is a *note* of the predicate.

d. Therefore *Maritain* well explains:

d1. "Every verb is equivalent to the verb *to be* followed by an attribute or predicate. 'I write' is equivalent to 'I am writing'. Thus the verb *to be* is justly entitled the verb *par excellence*.

d1a. "In a proposition such as 'I am' (we shall call such a proposition a 'proposition with a verb-predicate'), which is equivalent to 'I am existing', the verb *to be* exercises the function of both *copula* (inasmuch as it unites the subject to the predicate) and *predicate* (inasmuch as it signifies the existence attributed to a subject), but it directly *manifests* (in actu signato) the latter function only.

d1b. "In a proposition such as 'Peter is a man' (which we shall call a 'proposition with a verb-copula'), in which the verb *to be* is followed by the predicate it applies to the subject, the verb directly *manifests* only its function as copula.

d1c. "This copulative function is always implied by the verb *to be* (and consequently by all verbs) because it corresponds to the very act of the mind itself applying a determination (a predicate) to a subject.

d2. "The first sense of the verb *to be* is that in which the copulative function is exercised without being directly manifested as it is in other verbs and in which existence is attributed as a predicate to a subject: 'I am', 'Hector is no more' (propositions with verb-predicates).

d3. "From this first sense is derived the second wherein the verb *to be* directly manifests its copulative function: 'I am sick', 'Achilles is not invulnerable' (propositions with verb-copulas).

d4. "It is important to note that, even when used simply as a *copula*, the verb *to be* continues to signify at least *ideal* or *possible* existence. In fact the copula does nothing but express the relation (habitudo) of the predicate to the subject; but what relation? The relation of identification of one with the other, the relation by which these two objects of thought, distinct as concepts (*ratione*), are identified in the thing(*re*) in *actual* or *possible*, *real* or *ideal existence*. In other words, when used as a copula the verb *to be* affirms that the thing, with such and such determinations, exists either actually outside the mind or possibly outside the mind or, in the case of beings of reason, in the mind only.

d4a. "The proposition 'a myriagon is a ten-thousand-sided polygon' is equivalent to: 'the object of thought myriagon *exists* (*in possible existence outside the mind*) with this essential determination: ten-thousand-sided polygon.'

d4b. "When I want to signify that the determination (the form), 'unable to exist in reality' is found in a certain subject, e.g. a 'chimera' I have recourse to the notion of existence and the verb *to be* in order to combine these two objects of thought and I say 'A chimera is unable to exist in reality' that is 'the object of thought chimera exists (*in my mind*) with this property of being unable to exist in reality.'

d5. "Thus the verb *to be* always signifies existence in a proposition with a verb-copula just as much as in a proposition with a verb-predicate; and all propositions affirm or deny the *actual* or *possible*, *real* or *ideal existence* of a certain subject determined by a certain predicate. In other words, they either affirm or deny that this subject and this predicate are identified in actual or possible, real or ideal existence.

d6. "Therefore.......... truth, whether it be a truth in the 'ideal' or in the 'existential' order, always consists in the conformity of our mind with being or existence, with possible existence in the first case, and actual existence in the second.

d7. "Hence the logical law: for an (affirmative) proposition to be true:

d7a. "it is not enough:

d7a1. "that the predicate agree with the subject,

d7a2, "the subject must also exist in the manner of existence required by the copula.

d7b. For example, if I say 'Bonaparte is first consul' the proposition is not true because the subject, Bonaparte, does not exist in the actual existence required by this copula (that is, in the present time). Bonaparte was consul, but he is no more.........

d8. "The:

d8a. "Propositions which we are designating as 'propositions with a verb-copula' were called propositions 'de tertio adjacente' by the ancients; these include all such propositions as 'I am writing', 'Peter is a man', in which the subject, predicate and copula are explicitly stated.

d8b. "Likewise they called 'propositions with a verb-predicate' 'de secundo adjacente' (e.g. 'Peter lives', 'I write'), in which the verb signifies the predicate itself at the same time as it unites it to the subject.

d8c. "In a proposition 'de secundo adjacente', 'Peter is', the verb to be is attributed to the subject as a predicate, and signifies that Peter exists in reality.

d8d. "In a proposition 'de tertio adjacente', 'Peter is a man', the verb to be is not attributed to the subject as a predicate, but merely as joined to the predicate 'man' so as to form with it but a single member of the proposition attributed to the subject.

d9. "In all cases, whether it signifies the predicate itself, or is necessary in order to unite it to the subject, the verb 'stands with the predicate'.

e. All that has been said above, is indicated in the classical definition of VERB:

e1. Which is: "A VOCABLE CONVENTIONALLY SIGNIFICATIVE WITH TIME, WHEREOF NO PART SEPARATELY SIGNIFIES, FINITE AND DIRECT, AND ALWAYS IS A NOTE OF THOSE THINGS WHICH ARE PREDICATED OF ANOTHER - VOX SIGNIFICATIVA AD PLACITUM CUM TEMPORE, CUIUS NULLA PARS SIGNIFICAT SEPARATA, FINITA ET RECTA, ET EORUM, QUAE DE ALTERO PRAEDICANTUR, SEMPER EST NOTA." (Periherm. I, c.3, 16b, 6; cf. lect.5 S.Thomae).

e2. But, that any obscurity in the notion of the verb be obviated, the following explanations are proposed:

e2a. "A vocable conventionally significative" is the definition of term in common, stating what is common to all terms (n.64.)

e2b. The remaining elements in the definition distinguish the verb from those terms which are not verbs: to wit:

e2b1. "Significative with time" distinguishes the verb from the noun, which signifies without time, as explained above.

e2b1a. This means that the verb signifies a thing in the manner of an action or movement or with a certain mode that consists in being effected in time.

e2b1a1. Therefore the verb signifies in a single concept and as a single object: - take the example 'Peter sees' - :

e2b1a1a. both a certain thing ('vision' in the example given),

e2b1a1b. and a certain mode of proceeding in time: which mode of signifying is what is characteristic of the verb, differentiating it from the noun: which mode indeed consists in the action or movement according to which this thing (vision) is signified as flowing from the subject and joined with the subject.

e2b1a2. Accordingly even the verb 'is' signifies:

e2b1a2a. existence (the thing),

e2b1a2b. as exercised in time (the mode).

e2b1a3. That which is independent of time or is eternal is thereby excluded:

e2b1a3a. not from the things which the verb may signify (for a verb may signify something eternal, as in these examples: "A euclidian triangle has three interior angles together equal to two right-angles"; "Man is a rational animal"; "God is wise").

e2b1a3b. but from the manner wherein the verb signifies. For of itself the verb signifies things as taking place in time, eternal things being apprehended by our intellect by analogy with temporal things; wherefore eternal things are signified by our concepts and by our terms with a temporal mode which pertains, not to those things, but to our mode of signifying them.

e2b1b. Therefore "significative with time":

e2b1b1. does not signify that the verb must mark the difference between past, present and future time (indeed, on the contrary, as will be explained later, the past and future decline from the proper character of verb, - just as the oblique cases decline from the proper character of noun, as said above).

e2b1b2. but rather signifies that it is essential to the verb to signify something in the manner of an action or movement.

e2b2. "Whereof no part separately signifies" distinguishes the verb from a speech (discourse) and from a complex verb.

e2b2a. For:

e2b2a1. A (perfect) speech is constituted from a verb, but is not a verb.

e2b2a2. A complex verb is not a verb but is composed from several verbs.

e2b2b. This phrase "no part separately signifies" is to be understood of the part as it exists within the verb - as was said above regarding parts of the noun.

e2b3. "Finite" excludes infinite verbs (such as 'non-runs').

e2b3a. For an infinite term is no more a verb than it is a noun.

e2b3b. But note that a verb as it is within a proposition cannot be infinitated; for by the very fact that a negation is added, the proposition becomes negative.

e2b4. "Direct" excludes oblique verbs:

e2b4a. Such as:

e2b4a1. Past and future (tenses of) verbs; for these signify what was or will be: which is not signified by way of action or movement, but as what is in the past or the future.

e2b4a2. Optative and imperative moods: for neither do these signify an action as exercised in time by the subject.

e2b4a3. Subjunctive mood, which, inasmuch as it is subjunctive, is a mere grammatical mode of expressing the conjunction and subordination of a proposition: hence inasmuch as the subjunctive mood is reduced to the indicative, it is a verb (indicative).

e2b4b. For all these oblique verbs decline from the character of verb, - just as the oblique cases of the noun decline or fall away from the proper character of the noun, as explained above.

e2b4c. Wherefore the present indicative alone properly fulfils the notion of verb.

e2b5. "Always is a note of those things which are predicated of another" excludes the participle and the infinitive.

e2b5a. Which indeed must be excluded from the notion of verb:

e2b5a1. for though they signify with time,

e2b5a2. yet they can hold themselves on the side of the subject as well as on the side of the predicate, and therefore are reducible to the noun as well as to the verb.

e2b5b. For, as explained above, the verb must always hold itself on the side of the predicate.

67. DIVISION OF TERMS AS PARTS OF ARGUMENTATION: To the division of terms as they are part of an argumentation allusion has already been made where subject and predicate have been mentioned.

A. Although:
a. In common usage, subject (S) and predicate (P), along with the verb, are called elements of a proposition;
b. Yet more rightly they ought to be called parts of an argumentation.

B. For the illation or inference of one truth from another:
a. pertains:
a1. not to the copula,

a2. But to the S and P,

b. As Maritain says:

b1. "The basic elements of every enunciation (proposition), considered simply in itself, are the verb (be it merely a copula, or a copula and predicate united in one term) and the noun (subject or predicate).

b1a. "This is why we say that the division of the enunciative term" (i.e. the term as it is part of a proposition or enunciation) "into noun and verb is an essential one;

b1b. "Whereas its division into S, Pr. and C(opula) is an accidental division.

b2. "However, the division of the syllogistic term" (i.e. the term as it is part of a syllogism or argumentation) "into S and Pr. is essential, for in this case the term and the proposition are considered as parts of the reasoning.............

b3. "Considered as part of argumentation (the syllogistic term), the term is the last element into which every argumentation is necessarily resolved.

b3a. "It is not the function of the argumentation, as such, to construct or state the truth 'Peter is a man', that is, to unite the term man to the term Peter by means of the copula is. This is the function of the enunciation.

b3b. "Argumentation as such draws or infers:
from the fact that (I) 'Man is mortal',
and (II) 'Peter is a man',
the truth (III) 'Peter is mortal':
it unites Peter and mortal by means of man. Therefore the terms it admits of formally as an argumentation are the three terms Peter, mortal and man.

b3b1. "'Peter' is the subject of the conclusion;

b3b2. "'mortal' is the predicate of the conclusion;

b3b3. "'man', called the middle term, is the predicate of one of the premisses and the subject of the other.

b4. "The copula (and the verb inasmuch as it contains the copula) is not a syllogistic term; it does not belong to the syllogism formally, but only by presupposition, as a part of the propositions of which the syllogism is composed. The proposition itself, considered as part of argumentation is resolved into two terms only: the subject and the predicate." (Introd. to Logic, pp.56-57).

....

ARTICLE FIVE.

THE PRINCIPAL PROPERTY OF TERMS, OR SUPPOSITION.

68. ORDER OF PROCEDURE: As we have dealt with the division of terms, so now we deal with their properties, as terms are parts of the proposition.

A. For language has a certain inadequacy to, or deficiency from, thought, not being a copy or fac-simile thereof.

a. Wherefrom it is necessary that terms, as they are used in propositions as parts thereof, fulfil the character of propositional terms expressive of thought, according as they have certain properties which flow from their essence.

b. Which is thus well explained by Maritain:

b1. "Everything directly conceived or thought of by our intelligence, everything of which we have a concept or 'mental word' may be expressed or translated into language. But despite the flexibility, the docility, the delicacy of any system of language-signs, this expression is always more or less deficient in relation to thought. The loftiest intellectual knowledge, which reveals a world of consequences within a single principle, must, so to speak, be scattered and diluted in order to be orally expressed.

b2. "Indeed it would be absurd to expect material signs, uttered one after the other, to duplicate or furnish a fac-simile of the vital and immanent act of thought. Nor is it the purpose of language to furnish such a fac-simile of thought: its object is to permit the intelligence of the hearer to think, by an active repetitive effort, what the intelligence of the speaker is thinking. From this point of view human language performs its function perfectly. Granted the interpretative effort and the intellectual activity of the hearer, it is a perfect system of signs; suppress this effort and this activity and there remains but a radically insufficient system of lifeless symbols.

b2a. "In other words, language not only supposes an effort - often how bitter, authors know but too well - on the part of the one who expresses his thought, but also requires an effort on the part of the listener: a beneficent effort that keeps us from depending entirely on the sign and saves us from falling into what Leibnitz called 'psittacism', a parrot-like use of language.

b2b. "Nor would it be amiss to note in this connection that the more life and intellectual quality a philosophy possesses the more forcibly must that philosophy experience the distance between language and thought, without for all that cowardly forsaking all expression of the truth.

b2b1. "Hence a twofold necessity accrues to philosophy:

b2b1a. "It must acquire a mastery over language by means of a whole technical apparatus of forms and verbal distinctions (terminology),

b2b1b. "And it must unceasingly exact from the mind an act of internal vitality such that words and formulae can never replace, for they are but to spur the mind to this act.

b2b2. "All philosophy that relies upon words, all over-facile philosophy, is 'a priori' a philosophy of lesser thought and consequently of lesser truth.

b3. "Language, then, expresses or signifies as much of our thought as is necessary in order that another intellect, hearing the pronounced words, may present the same thought to itself. The remainder is not necessarily, and even should not be, expressed, lest it over-burden and infinitely complicate the winged signs of speech.

b3a. "This unexpressed margin of thought, to be supplemented by the intelligence of the hearer, is remarkably evinced by the diverse properties that affect the term considered, not by itself, but in the context of the proposition, as part of a proposition.

b3b. "The ancient logicians made an exhaustive study of these properties, a study that may seem irksome to inattentive minds, but one that is most instructive from the point of view that we have just indicated and absolutely indispensable for anyone who would acquire the art of reasoning.

b3c. "As Aristotle says, since we cannot bring the things themselves into our discussions, we have to let words appear for them and testify in their stead." (Note: "In discussions we use vocables instead of things, because we cannot bring the things themselves into midst of us": Aristotle: I Elench. I, 164a, 5). But we shall inevitably fall into a host of errors unless we observe that:

b3c1. "not only may the same word have several different meanings,

b3c2. "but also that the same word, even while having the same meaning (for example, the one given in the dictionary) and consequently even while signifying the same intelligible nature, may, according to its use in the context, stand for very different things." (Introd. to Logic, pp. 58-59).

B. The properties of terms, as they are parts of propositions, are six, to wit:

a. Supposition.
b. Appellation.
c. Amplification.
d. Restriction.
e. Alienation.
f. Diminution.

C. Since the chief of these is supposition:
a. The present article will deal with supposition,
b. The following article dealing with the others.

69. NOTION OF SUPPOSITION: The notion of supposition will be clear from the following process:

A. Let us take these examples:
a. "Man is a monosyllable."
b. "A man is a rational animal".
c. "A man is running."

B. In these examples, the subject 'man', if it is considered outside the proposition, has the same signification, to wit: it represents the nature of man, who is a rational animal.

C. But that same noun has itself otherwise INSIDE THE DIVERSE PROPOSITIONS.
a. In the first, it represents, not the significate, but the sign itself.
b. In the second, it represents every man, not only actual, but possible.
c. In the third, it represents only one individual.

D. NOR CAN IT BE SAID:
a. That the signification of the noun is diverse in the diverse propositions.
b. For the signification of a noun, as it is also in a proposition, is determined by the nature which the noun represents outside a proposition.

E. But the diversity of representations in propositions is induced BY THE EXIGENCIES OF THE COPULA.
a. In the proposition 'A man is a rational animal', 'man' represents every man actual and possible, because the copula here designates the existence of some essential predicate.
b. But in the proposition 'A man is running', 'man' represents one individual, because the copula here can designate only the actual existence of an accidental predicate, which actual existence is verified only concerning some individual subject.

F. This ACCEPTATION OF A TERM FOR SOMETHING WHEREOF IT IS VERIFIED IN THE PROPOSITION ACCORDING TO THE REQUIREMENT OF THE COPULA is called SUPPOSITION.

a. Therefore the supposition of a term, which is nothing else than its "SUBSTITUTE-VALUE", i.e. its value of being a substitute for some thing, of "standing for" some thing, may be described as the function which the term has in speech - without any variation of its signification - of holding the stead of a thing for which this substitution is legitimate, regard being had to the copula.

b. A term is said to SUPPOSE, insofar as it is taken in speech for something, whereof it is verified according to the requirement of the copula.
b1. Otherwise a term is said not to suppose.
b1a. Thus:
b1a1. In the proposition: 'Louis XIV was King of France', 'Louis XIV' supposes, for the copula 'was' requires something (some person) in past time for which the term 'Louis XIV' can be substituted: and indeed this requirement of the copula is satisfied, since in past time there is found some thing (some person) for which the term 'Louis XIV' can be substituted.
b1a2. But in the proposition: 'Louis XIV will be King of France', the subject 'Louis XIV' does not suppose, for the copula 'will be' requires some thing (person) in future time for which the term 'Louis XIV' can be substituted: but this requirement of the copula is not satisfied, since in future time there is found no thing (person) for which the term 'Louis XIV' can be substituted.

c. To judge whether some proposition is about a supposing subject or not, it is to be noted:
c1. That it is not required for supposition that the proposition be true or be verified, for also in a false proposition there can be supposition, as in the proposition: 'Louis XIV died at the age of twenty-two', for in this proposition 'Louis XIV' supposes, though the proposition is false. But this alone is necessary, that the acceptation of the term be verified or be legitimate in view of the requirement of the copula.
c2. That a copula always signifies be (existence), as said above, which be may be:
c2a. Actual real be; and then:
c2a1. In the past,
c2a2. Or in the present,
c2a3. Or in the future.

c2b. *Possible real be*.

c2c. *Mental or ideal be* (esse rationis).

c3. That accordingly all that is required for this, that a term suppose, is that the sort of existence denoted by the copula permits the substitution of the term for some thing.

d. *Supposition*, accordingly, differs from *signification or meaning:*

d1. For:

d1a. The *signification* of a (univocal) term is one and permanent;

d1b. But the *supposition* is manifold and variable according to the manner in which the term is used in a proposition.

d2. Because:

d2a. *Signification* has reference to *that wherefrom the giving of the name springs* (*that wherefrom the name is imposed*), i.e. to the form or nature which it represents to the mind (qualitas nominis).

d2b. Supposition has reference to *that to which the name is given* (*that whereto the name is given*), i.e. to the things or subjects (substantia nominis) to which the intellect *applies, in this way or that, the term itself in a proposition*, in order that the term may act as a substitute for the thing to which the intellect applies certain predicates.

d3. In other words:

d3a. *Signification*, which is "*representative* substitution for a thing", has reference to the *natures* or *essences* which are the object of the *first* operation of the mind (simple apprehension);

d3b. Whereas *supposition*, which is "*applicative* substitution", has reference to the *subject* in which these natures or essences are realized, and which the *second* operation of the mind (judgment) signifies as *existing* with such or such predicates.

d4. Thus, in the proposition: 'Man is social', the term 'man':

d4a. not only represents (renders present to the mind) human *nature* (taken concretely, i.e. in an abstract universal subject);

d4b. but also takes the place of the extra-mental *thing*, i.e. of the individuals to which sociality is attributed by the copula '*is*'.

70. DIVISION OF SUPPOSITION: From the examples above given, it is already evident that the *suppositions* of some term are *diverse.*

A. For:

a. In the proposition: '*Man is a monosyllable*', in which the sign (man) is taken FOR ITSELF, *not for the thing* signified, there is had MATERIAL SUPPOSITION, which is: THE TAKING OF A TERM FOR ITSELF.

b. But in the propositions: '*A man is a rational animal*', and '*A man is running*', where the sign (man) is taken for the THING signified, there is had FORMAL SUPPOSITION, which is: THE TAKING OF A TERM FOR THE THING WHICH IT SIGNIFIES.

c. To illustrate the necessity for distinguishing between *material* and formal supposition, take the following argumentation, which is bad because of a confusion between these suppositions:

> A monosyllable does not eat meat.
> But *man* is a monosyllable. (*Material* supposition).
> Therefore *man* does not eat meat. (*Formal* supposition).

B. But, further:

a. In the propositions: '*A man is a rational animal*', and '*A man is running*', the term 'man' supposes for a thing which it signifies PROPERLY;

a1. Wherefore in these propositions there is had PROPER SUPPOSITION;

a2. Which is: THE TAKING OF A TERM FOR WHAT IT SIGNIFIES PROPERLY.

b. But let us take another example: '*The Lamb was immolated for our sins*'.

b1. Here 'Lamb' supposes *formally*, because it stands for Christ, i.e. not for the sign itself but for a signified.

b2. Nevertheless, because 'Lamb' only METAPHORICALLY signifies Christ, this formal supposition is IMPROPER.

b3. For IMPROPER formal supposition is: THE TAKING OF A TERM FOR WHAT IT ONLY METAPHORICALLY SIGNIFIES.

c. The necessity for distinguishing between *proper* and *improper* formal supposition appears from the following argumentation, which is bad by reason of a confusion between these suppositions;

A lamb is an irrational animal. (Proper supposition).
But the victim immolated for the sins of the world
was a lamb. (Improper supposition).
Therefore the victim immolated for the sins of the world
was an irrational animal.

C. But:

a. In the examples given above (B.a.), of proper supposition, the noun 'man' is taken for the SUBJECT having human nature.

a1. Wherefore in both cases there is had PERSONAL SUPPOSITION;

a2. Which is: THE TAKING OF A TERM FOR THE SUBJECT HAVING THE NATURE SIGNIFIED.

b. But let us take this example: 'Vertebrate is a zoological branch'.

b1. Here the noun 'vertebrate' supposes indeed formally and properly, but not personally.

b2. For it supposes, not for the subject having vertebral nature, but for that nature only.

b3. Wherefore 'vertebrate' here has only SIMPLE SUPPOSITION;

b4. Which is: THE TAKING OF A TERM FOR THE NATURE ONLY WHICH IT SIGNIFIES.

c. The necessity for distinguishing between personal and simple supposition is illustrated from the following argumentation, which is bad because of confusion between personal and simple suppositions:

Vertebrate is a zoological branch. (Simple supposition).
But Fido (i.e. my dog) is a vertebrate. (Personal supposition).
Therefore Fido is a zoological branch.

D. OBSERVE:

a. That simple supposition, because it is verified of natures, not of the subjects having those natures, is only COMMON or UNIVERSAL, like natures themselves.

b. Which also can be verified in personal supposition, but not necessarily:

b1. For in the proposition: 'Man is a rational animal', 'man' has COMMON SUPPOSITION.

b2. But in the proposition: 'The man ran away rapidly', 'man' has SINGULAR SUPPOSITION.

E. But:

a. Just as the universal concept (cf. n.50), may be:

a1. Distributive or collective;

a2. Simply universal or particular.

b. So also supposition:

b1. Thus in the proposition: 'The Apostles were twelve', or 'The French are a logical people', 'Apostles' and 'French' have COPULATE (collective) SUPPOSITION; which is: THE TAKING OF A TERM FOR THE SUBJECTS WHICH IT SIGNIFIES TAKEN COLLECTIVELY.

b2. But in the propositions: 'Man is mortal' or 'Every man is mortal', or 'Every animal was in the ark', 'man' and 'animal' have DISTRIBUTIVE or DISTRIBUTED SUPPOSITION; which is: THE TAKING OF A TERM FOR EACH AND EVERY ONE OF THE THINGS WHICH IT SIGNIFIES.

F. But:

a. In the proposition: 'Every animal was in the ark', there is had INCOMPLETE DISTRIBUTIVE SUPPOSITION of 'animal' for here 'animal' designates, or is taken to stand for, not all individual animals, but all the GENERA of animals.

b. But in the proposition: 'Every man is mortal', 'man' has COMPLETE DISTRIBUTIVE SUPPOSITION, for here 'man' designates, or is taken to stand for, all the INDIVIDUALS having human nature.

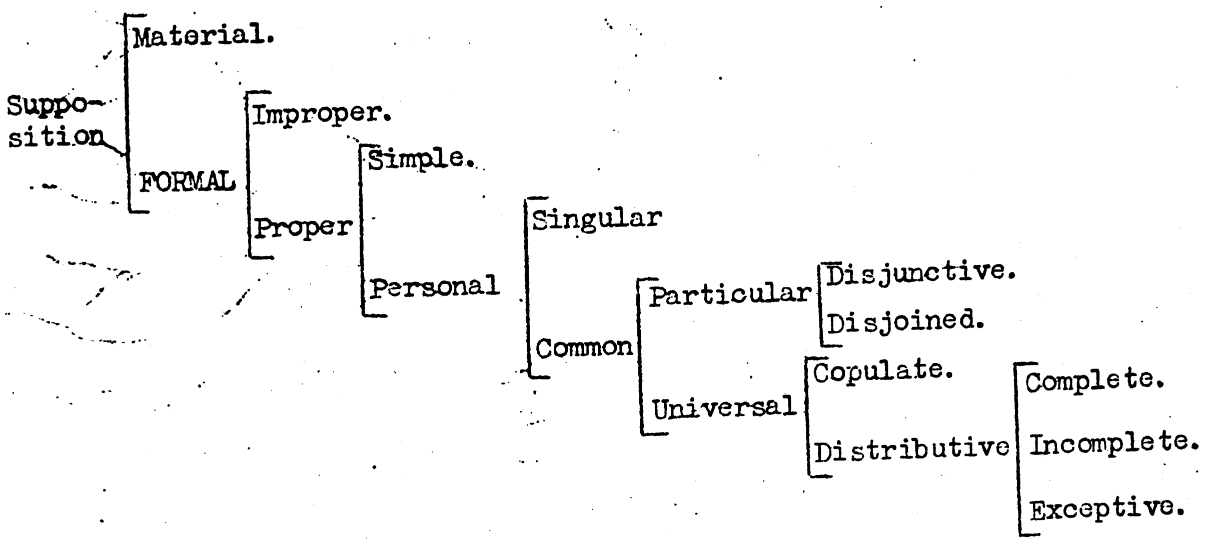
c. But distributive supposition may also be exceptive, as in the proposition: 'Every man that is merely man is born in sin', where 'man' designates all the individuals having human nature, YET WITH THE ADMISSION OF AN EXCEPTION: then is had EXCEPTIVE DISTRIBUTIVE SUPPOSITION.

G. But particular supposition may be either disjunctive (determinate) or disjoined (indeterminate):

a. In the proposition: 'Some man is a liar', where 'man' supposes for some determinate ones of the things which it signifies, there is had DISJUNCTIVE (DETERMINATE) PARTICULAR SUPPOSITION.

b. But in the proposition: 'Some instrument is necessary to make music', where 'instrument' supposes for some of the things which it signifies, but leaves them indeterminate, there is had DISJOINED (INDETERMINATE) PARTICULAR SUPPOSITION.

H. Hence the division of supposition may thus be illustrated schematically:-



71. RULES OF SUPPOSITION: The rules of supposition can be reduced to two laws, - which are of the greatest moment in regard to the syllogism:

A. "THE FIRST LAW: 'GENERALLY MAKES THE SUBJECT OF ANY ENUNCIATION SUPPOSE ACCORDING TO THE REQUIREMENT OF THE PREDICATE.'

a. "Accordingly:
a1. "If P is a numeral term, S supposes collectively;
a2. "If P essentially or necessarily befits S, S supposes distributively.
a3. "If P accidentally and contingently befits S, S supposes disjunctively (disjoinedly).

b. "Wherefore the supposition of S is known by this rule, that:
b1. "If the syncategorematic sign 'some' befits S, it makes S suppose disjunctively (disjoinedly).
b2. "If 'every', it makes S suppose distributively.
b3. "If 'all together', it makes S suppose collectively.

B. "THE SECOND LAW:
a. "'ALWAYS MAKES THE PREDICATE OF AN AFFIRMATIVE ENUNCIATION SUPPOSE DISJUNCTIVELY.'" Thus in the enunciation; 'Man is an animal', 'animal' supposes disjunctively, being then equivalent to 'some animal'.
b. "'ALWAYS MAKES THE PREDICATE OF A NEGATIVE ENUNCIATION SUPPOSE DISTRIBUTIVELY.'" (Pirotta: Summa Philosophiae, I, p. 78, n. 152). Thus in the proposition: 'Man is not a horse', 'horse' supposes distributively, being then equivalent to 'no horse'.

....

ARTICLE SIX.

THE OTHER PROPERTIES OF TERMS.

72. OTHER PROPERTIES OF TERMS MODIFY SUPPOSITION: Just as:

A. The supposition of a term is known from the syncategorematic signs which befit a subject:

B. So also the other properties of terms result from other diverse syncategorematic signs which modify supposition.

73. AMPLIFICATION: Amplification is the EXTENDING OR BROADENING OF A TERM'S SUBSTITUTIVE VALUE.

A. Thus:

a. The proposition: 'Every man is fallible' may be understood in two ways:

a1. As this: 'Every man actually existing is fallible'.

a2. As this: 'Every man (as a possible essence) is fallible'.

b. The term 'man' is broader in the latter than in the former.

c. This transit of a term from a less extension to another broader extension is called AMPLIFICATION.

B. In the example given, the amplification is effected by the substitution, at least mental, of some syncategoreme (v.g. 'possible') for another (v.g. 'actually existing'). Then the amplification is called AMPLIFICATION UNTO POSSIBLE BE.

C. Amplification can be effected by the suppression of some adjective, effecting that the proposition is extended to more supposits.

a. Thus, by the suppression of the term 'poor':

a1. The proposition: 'Every poor man is unhappy on this earth', is amplified to this:

a2. 'Every man is unhappy on this earth';

a3. In which latter proposition the term 'man' is broader than in the former proposition.

b. Then the amplification is called AMPLIFICATION TO MORE SUPPOSITS.

74. RESTRICTION: Restriction is the RESTRICTING OR NARROWING OF A TERM'S SUBSTITUTIVE VALUE, by a process inverse to that of amplification.

A. Thus:

a. In the proposition: 'Every man is fallible', where 'man' is taken for 'actually existing man', the term 'man' is used with restriction.

b. Likewise in the proposition: 'Everyone knows it', where the term 'everyone' is taken for 'everyone versed in philosophy' or 'everyone living in this town', the term 'everyone' is used with restriction.

B. In order however that restriction may be legitimately effected in an affirmative proposition, two conditions must be fulfilled, to wit:

a. The broader term, which is to be restricted, must be distributively universal.

b. The restricted term must have the same mode of existence. Thus from the proposition: 'Every man is rational', this restriction cannot be made: 'Therefore Louis XIV is rational': for, since Louis XIV does not actually exist, it cannot be said that he IS rational, but only that he WAS rational.

75. ALIENATION: Alienation is the TRANSFER OF THE SUBSTITUTIVE VALUE OF A TERM FROM PROPER TO IMPROPER OR METAPHORICAL.

A. Thus the proposition: 'The Lamb was slain', is alienated by the addition of this syncategoreme 'for the salvation of the world', for this addition transfers 'lamb' from its proper supposition to an improper or metaphoric supposition.

B. This transfer may occur:

a. Either in the SUBJECT on account of the predicate: as in the example given.

b. Or in the PREDICATE on account of the subject: as in the proposition: 'This philosopher is an ass', where 'ass' is transferred from proper to improper supposition owing to the subject: 'philosopher'.

76. DIMINUTION: Diminution is the REDUCTION OF A TERM TO A LESS EXTENDED SUPPOSITION THAN IT HAS SIGNIFICATION.

A. Thus in the proposition: 'Every argument is good insofar as it is true', the subject 'argument' has a less extended supposition than it has extension. For:

a. Although it has no restriction,
b. Nevertheless it supposes only for every true argument.

B. Therefore diminution is not to be confused with restriction (n.74)
a. For in restriction, a term is restricted by means of a syncategoreme.
b. But diminution is obtained by the sole use of the term in the proposition.

77. APPELLATION: Appellation is the APPLICATION OF THE FORMAL SIGNIFICATE OF ONE TERM TO THE FORMAL SIGNIFICATE OF ANOTHER, as for example in the proposition: 'Peter is a heavy eater'.

A. For in this example:
a. 'Heavy':
a1. is not predicated simply or absolutely of Peter;
a2. but only under qualification (secundum quid), to wit, 'as an eater';
b. So that the appellating term (heavy) signifies something other than what it signifies when predicated simply or absolutely (than what it signifies in this proposition: 'Peter is heavy').
c. For appellation applies something (to wit, the significate of heavy') to a subject:
c1. not simply or absolutely.
c2. but only by the medium of some formality or determination signified by the term (eater) which it appellates or 'calls down' or re-imposes upon the subject (Peter).

B. Appellation IS NOT TO BE CONFUSED with simple predication.
a. For:
a1. In appellation, the subject must be considered, not only as subject, but also as endowed with a certain determination by means of which it receives the predicate; (v.g. 'Peter' is taken as endowed with the formality or determination 'eater' and by means of this determination receives the predicate 'heavy').
a2. Therefore in appellation, predication is not made save with the particle (expressed or not) 'as', or 'as such', or 'qua' or 'inasmuch as' or 'insofar as' or 'according as' or some such: for otherwise there is had:
a2a. not appellation,
a2b. but simple predication.
b. The confusion of appellation with simple predication leads to such sophisms as these:

b1. Aristotle was great. (Simple predication).
But Aristotle was an eater.
Therefore Aristotle was a great eater. (Appellation).

b2. He who wills the sufferings of others is cruel.
But God wills the sufferings of others (of the damned).
Therefore God is cruel.

b2a. Wherein the first proposition is thus to be distinguished:-

"He who wills the sufferings of others"
- as willing evil to them, "is cruel": (TRUE).
- as willing what is just, "is cruel": (FALSE).

b2b. And wherein the second proposition is to be contra-distinguished thus:

"God wills the sufferings of the damned"
- as evil to them: (FALSE).
- as just: (TRUE).

78. GENERAL CONCLUSIONS: From what has been said regarding the properties of terms (nn. 68-77):

A. Three conclusions follow: to wit:

a. The necessity of distinguishing in discussions, in order to avoid sophisms.

b. The impossibility of finding signs of the concept so determinate that it would be possible to use these signs without paying heed to their significate and use.

c. The proposition is not a mere juxtaposition of concepts, but enjoys a true unity: for otherwise there would follow no property from the assumption or acceptation of terms in a proposition.

B. Which is thus lucidly expressed by Maritain: The "brief survey of the diverse properties of the term in the proposition is instructive in several respects.

a. "For if we have really understood that a single term may stand for different things in discourse, even while it keeps the same signification (corresponds to the same concept, and to the same word in the dictionary) - if we have really understood this - then we shall also understand why the necessity of 'distinguishing', i.e. making distinctions, dominates all human discussions. We shall comprehend also why this necessity arises from the specific character of our intelligence: not only because the same word may signify different concepts, but also because words being the material tools, and concepts the immaterial tools, of rational activity, the reason may put the same concept and the same word with its signification unchanged to different uses.

b. "We shall also understand how useless it would be to attempt to substitute for the Logic of ideas or of concepts, which always supposes the activity of the mind using concepts and words as tools, a logic of written or oral signs, so perfect as to dispense with thought and be sufficient unto itself (the universal characteristic of Leibnitz - modern Logistics). Of course, a system of signs more perfect and more rigid than ordinary language may be conceived; but, with the exception of certain limited domains, such as that of algebra, we shall never succeed in completely suppressing the margin of indetermination that subsists around the oral or written sign, and attests to the transcendence of thought over its material symbols.

c. "Finally, from another point of view, if we understand that the same word stands for such and such a thing, and has such and such a value for thought, depending upon the structure of the proposition of which it is a part, we have already laid hold of an important truth, namely that: the proposition is not a mere juxtaposition of words considered as things, but forms a true unity, and is a true whole composed of words taken as parts." (Maritain: Introd. to Logic, pp. 75-76).

....

SCHEMATIC SUMMARY.

79. SCHEMATIC RECAPITULATION: The contents of the foregoing chapter may be thus schematically summarized:-

- On terms
  - Their NECESSITY arises from
    - The social nature of man.
    - The universality of the concept.
    - The sensible origin of human knowledge.
  - Their NATURE
    - On the sign:
      - Its notion: THAT WHICH REPRESENTS TO A COGNOSCITIVE POWER SOMETHING OTHER THAN ITSELF, AS HOLDING THE STEAD THEREOF.
      - Its division
        - On the score of its order to cognoscitive power
          - FORMAL.
          - INSTRUMENTAL.
        - On the score of the cause ordering it to the signed
          - NATURAL.
          - CONVENTIONAL.
    - On the term or sign of the concept:
      - Its NATURE
        - Its notion: A VOICE-SOUND CONVENTIONALLY SIGNIFICATIVE.
        - Its division
          - In itself: As for concepts.
          - As a part
            - Of the proposition
              - NOUN
              - VERB.
            - Of argumentation
              - SUBJECT.
              - PREDICATE.
      - Its PROPERTIES
        - The principal: SUPPOSITION.
        - The others
          - AMPLIFICATION.
          - RESTRICTION.
          - ALIENATION.
          - DIMINUTION.
          - APPELLATION.

……

SECTION TWO.

……

PREDICABILITY ITSELF IN GENERAL.

……

80. ORDER OF PROCEDURE: Since predicability is nothing other than a property of the universal, it cannot be understood unless the nature of the universal be known.

A. But the nature of the universal can be considered in two ways, to wit:

a. *First*, *IN ITSELF*,
b. *Secondly*, *RELATIVELY* to those things whereof it is predicable.

B. Wherefore this section will proceed according to the following order:-

On the nature of the universal
- On the universal IN ITSELF...............Chapter five.
- On the universal RELATIVELY TO ITS INFERIORS.........................Chapter six.

……

CHAPTER FIVE.

THE NATURE OF THE UNIVERSAL IN ITSELF.

81. ORDER OF PROCEDURE: This chapter:

A. Will:
a. *First*, show the necessity to establish the nature of the universal.
b. *Secondly*, expose certain preliminary observations regarding the question of the nature of the universal.
c. *Thirdly*, establish the nature of the universal: regarding which it will be shown:
c1. *In the first place*, that the universal represents the real nature of things;
c2. *In the second place*, that the universal exists as universal only in mind, but in things as singular.
d. *Fourthly*, establish the nature of predicability.

B. Hence the following order:-

On the nature of the universal in itself:
- Necessity to establish the nature of the universal..............................Article one.
- Certain preliminary observations..................Article two.
- The nature of the universal:
  - It represents the real nature of things...................Article three.
  - It exists as universal only in mind; but in things as singular.........................Article four.
- The nature of predicability.......................Article five.

……

ARTICLE ONE.

NECESSITY TO ESTABLISH THE NATURE OF THE UNIVERSAL.

82. TREATMENT OF PREDICABILITY: Having acquired knowledge of those things which must be known antecedently to the study of predicability, the question regarding *PREDICABILITY ITSELF* occurs. Regarding this, following the natural order of our knowledge:

A. First, predicability IN GENERAL must be dealt with: (which is done in the present section).

B. Then, predicability IN SPECIAL must be treated: (which will be done in section three).

83. NOMINAL DEFINITION OF PREDICABILITY: But already we have some confused notion of what predicability is, just as we already know what predication is.

A. For in the proposition: 'Peter is a man':
a. 'Man' is predicated of Peter.
b. The act whereby it is affirmed that the concept of man befits the subject 'Peter' is PREDICATION.

B. But this is possible:
a. Only because the predicate can be said of Peter.
b. This capacity of the predicate is called PREDICABILITY:
c. Which accordingly is: THE CAPACITY OF A PREDICATE TO BE SAID OF A SUBJECT.

84. UNIVERSALS ALONE ARE PREDICABLE: But not every concept can be a predicate.

A. In these examples:
a. 'Peter is a man':
a1. S is singular;
a2. P is particular (from the second law of supposition: n. 71).
b. 'Man is an animal':
b1. S is universal;
b2. P is particular.
c. 'A dog is not a man':
c1. S is universal.
c2. P is universal.

B. Examples could be multiplied indefinitely, but always the predicates would be found:
a. To be:
a1. either universals,
a2. or particulars;
b. but never signulars.

C. In other words:
a. Universals alone (simply universal or restricted universals: cf. nn. 50, 54) are predicable.
b. And thus it already appears - even though we do not yet know the reason thereof - that predicability befits the universal alone, or, in other words, is a property of the universal.

D. AND THEREFORE, in order to find the reason of predicability as it is the property of the universal, it is necessary to investigate the nature of the universal.

……………………………………

ARTICLE TWO.

PRELIMINARY OBSERVATIONS.

85. NOTION OF UNIVERSAL: 'Universal' according to etymology would signify 'one towards others' 'unum versus alia); or one respecting others.

A. But:
a. Because one can respect others:
a1. Either in signifying others;
a2. Or in representing others;
a3. Or in causing others;

a4. Or in being others;
b. Therefore is universal divided into:
b1. Universal in signify-ing (universale in significando);
b2. Universal in represent-ing (universale in representando);
b3. Universal in caus-ing (universale in causando);
b4. Universal in be-ing (universale in essendo).
c. Which are thus defined:

c1. Universal in signifying is: ONE SIGNIFYING MANY; wherefore an oral term which signifies many is a universal in signify-ing; as is the oral term 'man' which signifies Peter and Paul and John and Margaret and Cecilia and Agnes.

c2. Universal in representing is: ONE REPRESENTING MANY; wherefore a formal concept which represents many is a universal in representing; as is the formal concept 'man' which represents Peter and Paul and John and Margaret and Cecilia and Agnes.

c3. Universal in causing is: ONE CAUSING MANY; wherefore the sun is universal in causing warmth in many bodies upon this earth, and accordingly is called a universal cause; whereas the most universal cause is God, who is a cause universal to absolutely all effects.

c4. Universal in being is: ONE EXISTING IN MANY AND SAID OF MANY; wherefore one nature (i.e. one objective character, or one objective concept), which exists in many as identified with them and multiplied in them, wherefore also it is predicated of them, is a universal in being; and indeed since it is one predicated of many, it is also called UNIVERSAL IN BEING PREDICATED (universale in predicando); thus does that one nature which is named by the name 'man' exist in Peter and Paul and John and Margaret and Cecilia and Agnes as identified with each of them and multiplied in them, and therefore is predicated of them distributively.

d. Which division may be thus shown schematically:-

Universal
- In signify-ing: ONE SIGNIFYING MANY.
- In represent-ing: ONE REPRESENTING MANY.
- In caus-ing: ONE CAUSING MANY.
- In be-ing or in be-ing predicated: ONE EXISTING IN MANY AND SAID OF MANY.

B. Here we are concerned immediately with the universal in be-ing: Concerning which, NOTE:

a. That those whereof it is said (predicated) are called its inferiors: thus Peter and Paul and John and Margaret and Cecilia and Agnes are called the inferiors of man; just as Nightmarch and Windbag and Phar Lap and Bernborough are called the inferiors of horse.

b. That the universal in be-ing is to be distinguished from the COMMON:
b1. For:
b1a. Common is WHATSOEVER ONE IN WHATSOEVER WAY BEFITTING MANY.
b1b. But universal (in be-ing) is a COMMON BEFITTING MANY AS IDENTIFIED WITH THEM AND MULTIPLIED IN THEM.
b1c. Wherefrom it is clear that 'common' is a wider term than 'universal'.
b2. Accordingly:
b2a. 'Common' does not determine whether that which is communicated with many, is numerically the same or not.
b2b. But 'universal' does determine this, because that which is communicated to many as universal to them is never numerically the same in the many.
b3. Thus:
b3a. The divine nature is common to three persons, but it does not have itself towards them as a universal towards inferiors, since it is numerically the same in them all; whereas 'man' is found in Peter and Paul and John not as numerically the same in them, and similarly 'horse' is found in Mightmarch and Windbag and Phar Lap not as numerically the same in them.
b3b. Likewise, a room is a common place of many men, but it is not a universal whereof they are the inferiors.

86. THE QUESTION: The question on the nature of universals is one of the most principal questions of all philosophy.

A. This question has engaged the vigorous attention of philosophers throughout the ages; and it is still very much alive:

a. For it is not really a different question from that of the value of our intellectual knowledge, which is a question upon which ardent controversy has raged, especially from the time of Descartes and Kant until our own day.

b. In the Middle Ages this question was celebrated under the title of "The quarrel on universals".

B. The QUESTION is this: Whether THE UNIVERSAL:

a. Is a mere noise (flatus vocis), or a term to which corresponds NEITHER a universal concept NOR a universal reality, but only a collection of individuals;

b. Or is a concept, universal indeed, BUT VOID OF UNIVERSAL REALITY;

c. Or are not only the term and the concept universal, BUT THE VERY REALITY ITSELF UNIVERSAL?

C. Which question may be thus set forth schematically:

Is the universal

- a. Merely ONE NAME whereby many singulars are NAMED TOGETHER;
- a1. And hence, so to speak, a mere 'short-hand name' whereby many names of singulars are collected by abbreviation into one name.
- a2. Which is the doctrine of NOMINALISM.

- b. Or also ONE CONCEPT, universal indeed, but whereby no universal reality is conceived or represented.
- b1. So that the universal is a mere FIGMENT OF MIND.
- b2. Which is the doctrine of CONCEPTUALISM.

- c. Or ONE REAL NATURE; and hence, so to speak, one 'block of reality':
- c1. Which is:
- c1a. conceived or represented by one concept (the universal concept),
- c1b. and signified or named by one name (the universal term);
- c2. So that:
- c2a. neither is the universal concept a mere concept whereby nothing real is conceived;
- c2b. nor is the universal term a mere term whereby many singulars are signified or named together;
- c3. But rather:
- c3a. the universal concept immediately represents one real nature,
- c3b. and the universal term immediately signifies (the concept of) one real nature.
- c4. Which is the doctrine of REALISM.

87. FOUNDATION OF THE SOLUTION: The solution of this question is based upon the unshaken data delivered by the testimony of consciousness.

A. These data of consciousness are:

a. Not the same is it to know some thing (v.g. what is man), and to know the idea of this thing (v.g. the idea of man).

b. The knowledge of some thing (v.g. of man), precedes the knowledge of the idea of that thing (v.g. the idea of man). For consciousness bears witness:

b1. That I DIRECTLY know MAN or HORSE;

b2. And INDIRECTLY, through reflexion only, know the IDEA of man or of horse.

B. From the analysis of these data, it follows that the idea or formal concept is not that which is directly known, but is only that wherein we immediately know the thing.

a. This was not understood by Descartes, who taught that what we know immediately is ideas (which accordingly, for Descartes, are that which we immediately know, not that wherein we immediately know things), from which we mediately know things.

b. This error is the source of idealism: for it is impossible to find a 'bridge' from ideas to things:

b1. And accordingly this logical conclusion of this position is found in Kant, who taught that things as they are in themselves are unknowable;

b2. And still more radically is it found in Berkeley, who denied the existence of sensible things.

……………………………

ARTICLE THREE.

THE UNIVERSAL REPRESENTS THE REAL NATURE OF THINGS.

88. DIVERSE DOCTRINES: As indicated above, regarding the nature of the universal, diverse doctrines are held by NOMINALISTS by CONCEPTUALISTS, and by REALISTS. Accordingly:

A. First, will be exposed:
a. Nominalism (n.89).
b. Conceptualism (n.90).

B. Next, it will be shown why these doctrines cannot be held, and that therefore realism must be admitted (n.91).

89. NOMINALISM: Nominalists hold that to the universal oral term there corresponds in the mind, not even a universal concept, but only a COLLECTION OF INDIVIDUALS.

A. This doctrine was taught:
a. IN ANTIQUITY:
a1. By Heraclitus;
a2. By Cratylus;
a3. By the latter's disciple, Epicurus.
b. IN THE MIDDLE AGES, by Roscelin (9th century).
c. IN MODERN TIMES, by the EMPIRISTS and SENSISTS, such as:
c1. Hobbes (1588-1679).
c2. Locke (1632-1704).
c3. Hume (1711-1776).
c4. Condillac (1715-1780).
c5. Wundt (1831-1921).

B. This doctrine is erected upon either of two foundations, to wit:

a. The confusion of intellective knowledge with sensitive knowledge: which is the foundation whereupon the SENSISTS build the doctrine of nominalism.

b. Or the theory of MERELY PASSIVE intellective knowledge, according to which the intellect has experience of singular things, but cannot by abstraction go beyond this experience: which is the foundation upon which EMPIRISTS AND POSITIVISTS build the doctrine of nominalism.

90 CONCEPTUALISM: Conceptualists (who are really mitigated nominalists), admit indeed that the universal oral term is a sign of A UNIVERSAL CONCEPT, to which however there corresponds nothing universal in the real: wherefore the universal is a figment of mind.

A. This doctrine was taught:
a. IN ANTIQUITY by Zeno of Citium and the Stoics.
b. IN THE MIDDLE AGES;
b1. By William of Occam.
b2. By John Buridan.
b3. By Pierre d'Ailly.
b4. By Gabriel Biel.
c. IN MODERN TIMES:
c1. By Kant and the Kantians;
c2. by idealists.

c3. By many others more or less imbued with Kantian teaching.

c4. In some way by all:

c4a. Who exaggerate the activity of the intellect, conceiving this activity as constructive, as does Archambault.

c4b. Or who think that the singular is the only reality, as Blondel and J. Chevalier.

c5. And generally, in some way at least, by all who, following Suarez, deny the real distinction between essence and be in things other than God, - for according to their doctrine real essence cannot be logically conceived save as existing, and therefore as singular.

B. The principal foundation of conceptualism is exaggeration of the activity of the intellect which is conceived as a faculty merely constructive of its object: whence it follows that the object is not the measure of the intellect, but the intellect measures the object: which is the error of SUBJECTIVISTS AND IDEALISTS.

C. Wherefrom it is evident how the foundations of conceptualism and of nominalism are thoroughly opposite.

91. NECESSITY TO ADMIT REALISM: The necessity to admit realism appears from the following considerations:

A. For:

a. Indeed:

a1. The Nominalists teach what is true inasmuch as they affirm that our intellect acquires knowledge from things;

a2. The conceptualists teach what is true inasmuch as they affirm the activity of the intellect.

b. But they both err:

b1. The Nominalists indeed err inasmuch as they deny the activity of the intellect;

b2. The Conceptualists indeed err inasmuch as they deny that human knowledge is measured by things.

B. But both these things, to wit, the activity and the passivity of the human intellect, are together maintained by REALISM: and rightly so, since, as is shown at length in psychology, and is critically vindicated in defensive metaphysics:

a. The human intellect acquires its knowledges from the senses, and therefore must be said to be passive.

b. Yet not passively does it acquire them, as primary matter acquires determinations, but actively, so that the act of knowledge is elicited by the intellect.

C. And therefore:

a. By reason of the passivity of the intellect, the object of the intellect is indeed an external reality;

b. But by reason of the activity of knowledge, this reality is apprehended otherwise than in the real, to wit, abstractively and universally.

D. Therefore the doctrine of REALISM must be maintained, according to which the universal is a concept representing a UNIVERSAL REAL NATURE.

a. As is testified by consciousness:

b. According to which:

b1. the intellect, as said above (n.87), apprehends, for example, WHAT IS MAN or the UNIVERSAL NATURE of man, before it apprehends the idea of man:

b2. or, in other words, apprehends the OBJECTIVE concept of man before it apprehends the formal concept.

....

ARTICLE FOUR.

THE UNIVERSAL EXISTS AS UNIVERSAL IN MIND ONLY.

92. CONCLUSION: Nevertheless, it must be said that THE UNIVERSAL EXISTS AS UNIVERSAL IN MIND ONLY, BUT IN THINGS AS SINGULAR, as will appear from the following considerations (nn.93-96).

93. RIGHT UNDERSTANDING OF THE REALISM OF THE UNIVERSAL: For the realism of the universal must be rightly understood:

A. For:

a. A universal nature, or objective concept, which is the essence of the formal concept wherein the universal nature is immediately apprehended, has universal existence in the mind;

b. And the formal concept is nothing other than the objective concept, or the very nature of the thing INASMUCH AS IT EXISTS AS UNIVERSAL IN THE MIND.

B. Which may be thus illustrated schematically:-

In the universal are to be distinguished	The essence or the very nature of the thing	- OBJECTIVE CONCEPT	FORMAL CONCEPT
	Universal existence..................... IN MIND		

C. THE QUESTION is:

a. Whether the NATURE, which as universal exists in the mind, has also OUTSIDE THE MIND, another UNIVERSAL existence?

b. Or, in other words: Whether the universal represents something REAL not only as regards the nature represented but also AS REGARDS THE UNIVERSAL EXISTENCE?

94. PLATONIC REALISM: To this question Plato answers that: Universals exist AS UNIVERSALS OUTSIDE THE THING, IN THEMSELVES.

A. For Plato posited subsistent IDEAS, or incorruptible, eternal, forms, transcending the matter of things, which forms nevertheless would in some way be participated by matter.

B. But wrongly does he assert this:

a. For when he says that we immediately apprehend these subsistent Ideas,

b. He contradicts the evident testimony of consciousness, which teaches that we conceive natures as abstracted from singulars, as said above.

95. CAMPELLIAN REALISM: Nor can it be said, according to another form of realism, attributed to William of Champeaux (1072-1121), that the nature exists AS UNIVERSAL IN SINGULAR THINGS, and thus is not multiplied in individuals of the same species, but is NUMERICALLY ONE and the same in them all.

A. This doctrine, at least as regards its substance, was taught by the NEO-PLATONISTS, by HEGEL, and by SCHELLING:

a. According to whom singulars are only phenomenal apparitions of a universal nature.

b. Which doctrine is monistic.

B. Nor does the teaching of Scotus lack some affinity with this doctrine.

a. For:
a1. Although he rejects monism;
a2. His teaching scarcely avoids the seed of monism, inasmuch as he teaches, IN REALITY if not in word, that universals exist AS UNIVERSAL in singular things and ARE NOT IDENTIFIED with individuals.
b. Wherefore:
b1. Although he says that the universal is multiplied in individuals; - whereby he avoids monism - :
b2. He leaves this multiplication insufficiently explained.

C. But it is false to say that natures are not identified with individuals.
a. The SIGN of this is, that the universal represents the nature as predicable of singulars.
b. But a nature which is represented as predicable of singulars, must be identified with them: since for the truth of affirmative predication is required strict identity in the real between predicate and subject.

96. NECESSITY OF ADMITTING ARISTOTELICO-THOMISTIC REALISM: Therefore:

A. Those forms (Platonic and Campellian) of EXAGGERATED REALISM are to be rejected.

B. And the Aristotelico-Thomistic doctrine of MODERATE REALISM is to be admitted, according to which:
a. THE UNIVERSAL does not exist as universal save in the mind, but in things as singular:
b. Wherefore THE UNIVERSAL IS DEFINED:
b1. A NATURE ABSTRACTED FROM SINGULARS, IDENTIFIED WITH THEM AND MULTIPLIED WITH THEM;
b2. Or, more briefly: ONE (one nature) IN MANY (existing as singular in many individuals) AND OF MANY (predicable of many individuals).

C. Whence it appears that, as said above (n.85 B.b.), the universal differs from the common which IS NOT MULTIPLIED with individuals: as the divine nature is common to three persons.

D. But this universal nature:
a. according as it exists in the real as singular, is the MATERIAL universal, i.e. the matter of the universal;
b. but according as it is abstract, is the FUNDAMENTAL universal, inasmuch as, as abstract, it is capable of attribution to many subjects, i.e. it is the foundation of attribution;
c. but according as it is actually considered as predicable of many subjects, it is the FORMAL or LOGICAL universal. (Cf. Perihermeneias, Lib.I, c.VII, lect.X.).

E. In order the more profoundly to understand these things, which are of the highest importance, we must in each thing distinguish:
a. The essence or nature and its existence;
b. And acknowledge that the existence is in the real singular, but in the mind universal (intentionally).
c. And that the nature abstracted from all existence is neither properly singular nor properly universal.
d. But that the nature (essence) as it exists in the mind through abstraction is universal, and that in virtue of this existence of it in the mind is had the proximate foundation of the intention both of universality or of BE-ING in many and of predicability or of BE-ING PREDICATED of many.

F. Therefore the universal:
a. According as it designates the THING CONCEIVED or the NATURE abstracted by the mind, is called the METAPHYSICAL universal or is REAL being, which is treated of by the metaphysician or the natural philosopher.
b. According as it designates the MODE OF CONCEIVING, that is, the nature as respecting inferiors, of which it can be predicated, is called the LOGICAL universal, or is CONCEPTUAL being (ens rationis - thoughty being) OF SECOND INTENTION, which is treated of by the logician.

97. DOCTRINAL CONTRAST: From what has been said the following summary contrast of doctrines is gathered:-

Doctrines regarding the nature of the universal: The universal is

- Merely ONE NAME whereby many singulars are named together: to which name corresponds neither any universal concept nor any universal thing:
  - Which doctrine is NOMINALISM.
  - Which has been rejected above (n.91).
- Or also ONE CONCEPT, universal indeed, but to which no universal reality corresponds, and which accordingly is a mere figment of the mind:
  - Which doctrine is CONCEPTUALISM.
  - Which has been rejected above (n.91).
- Or a REALITY as well as a name and a concept: which universal reality is:
  - Outside singular things:
    - Which doctrine is PLATONIC EXAGGERATED REALISM.
    - Which has been rejected above (n.94).
  - Within singular things:
    - But is not multiplied in them:
      - Which doctrine is CAMPELLIAN EXAGGERATED REALISM.
      - Which has been rejected above (n.95).
    - and is multiplied in them:
      - Which doctrine is the MODERATE REALISM of Aristotle and St. Thomas.
      - Which has been proved above (nn.87, 91, 93, 96).

……

ARTICLE FIVE.

NATURE OF PREDICABILITY.

98. CONCLUSION: It follows from what has been said, as the following considerations (nn.99-100) will make clear, that: PREDICABILITY CONSISTS IN A MENTAL RELATION (relatio rationis) OF A UNIVERSAL NATURE TO MANY IN BE-ING PREDICATED, AND IS AS IT WERE A CERTAIN PROPERTY OF UNIVERSALITY OR OF APTITUDE TO BE IN MANY.

99. NATURE OF PREDICABILITY: For:

A. Predicability, as is manifest from its name, is the aptitude which a universal nature has to be predicated of many.

B. But this aptitude is a conceptual relation (relatio rationis - thoughty relation) of a universal nature to many in be-ing predicated.

C. Therefore predicability is the very essence of the LOGICAL UNIVERSAL.

100. PROXIMATE FOUNDATION OF PREDICABILITY: Moreover the proximate foundation of predicability is the INTENTION OF UNIVERSALITY.

A. For:

a. Just as actual predication is based upon actual identity of subject and predicate,

b. So predicability, or aptitude to be predicated, is based on aptitude to be in many or in the intention of universality.

B. Therefore predicability follows universality, and is, as it were, a certain property of universality. (Cf. John of St. Thomas: Cursus Philos., Logica, I, p.336 b.)

……

SCHEMATIC SUMMARY.

101. SCHEMATIC RECAPITULATION: The contents of the fore-going chapter may be thus schematically summarized:-

The Universal is something REAL or the NATURE OF A THING
- Which is denied by
  - NOMINALISM: which says that the universal is a mere voice (animal noise).
  - CONCEPTUALISM: which says that the universal is a figment of mind.
- Which, if it be considered
  - as really existing
    - is not UNIVERSAL (as exaggerated realism contends)
      - whether outside the thing in itself, as Plato contends.
      - Or inside the thing, as William of Champeaux contends.
    - But is SINGULAR IN THE THING:
      - Which is the doctrine of MODERATE REALISM.
      - Which doctrine is taught by Aristotle and St. Thomas.
      - And is called the MATERIAL UNIVERSAL.
  - As ABSTRACTED from real existence
    - and also from mental existence
      - Neither is universal.
      - Nor is singular.
    - but not from mental existence, is universal: and can be considered
      - either in itself
        - AS REGARDS THING CONCEIVED.
        - Then it is the METAPHYSICAL UNIVERSAL.
      - or relatively to inferiors OR AS REGARDS MODE OF CONCEIVING:
        - Is apt to BE in many
          - Then the intention of universality is had.
          - And then it is the fundamental universal.
        - Whose property is PREDICABILITY
          - Which is aptitude for predication.
          - And then it is the LOGICAL UNIVERSAL.

……

CHAPTER SIX.

……

THE UNIVERSAL CONSIDERED RELATIVELY TO ITS INFERIORS, OR THE DISTINCTION OF METAPHYSICAL DEGREES.

……

102. ORDER OF PROCEDURE: This chapter:

A. Will:

a. First, explain the question which calls for solution.

b. Secondly, expose and prove the solution thereof: and indeed:

b1. In the first place, by showing that between metaphysical degrees there is no distinction on the part of the thing.

b2. In the second place, by showing that the distinction between metaphysical degrees is not a distinction of name only, but of concept.

B. Hence the following order:-

- On the distinction of metaphysical degrees:
  - Explanation of the question ……………………Article one.
  - Solution of the question
    - The distinction is not on the part of the thing………………………………Article two.
    - Nor is it merely on the part of the name, but is on the part of the concept………………………………Article three.

……

ARTICLE ONE.

THE QUESTION.

103. WHICH IS THE QUESTION: So far we have considered the universal in itself. Yet we have said that the logical universal is apt to be predicated of inferiors. Now the metaphysical universal, which is the foundation of predicability, is to be considered relatively to the subject whereof it can be predicated.

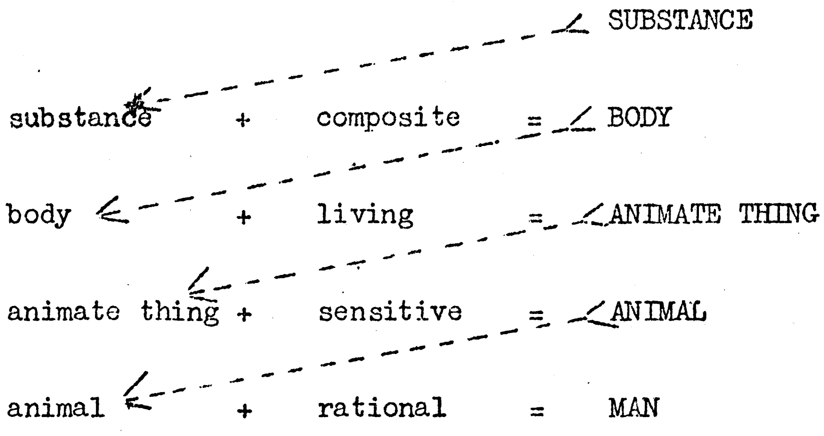
A. Already indeed we know that it is identified, AS REGARDS THE THING REPRESENTED, with the singular (n.96).

B. Wherefrom we can at once conclude that, if diverse essential universals are predicated of the same subject, they are all identified with the subject.

C. But the question arises: WHICH KIND OF DISTINCTION IS THERE BETWEEN THESE DIVERSE PREDICATES?

104. GENERIC, DIFFERENTIAL AND INFERIOR PREDICATES: Let us take this example: "Peter is a substance, a body, an animate thing, an animal, a man." Or this example: "Peter is a composite, living, sensitive, rational being."

A. NOTE that each predicate of the latter example contracts a predicate of the former example, to form the following predicate:-



SUBSTANCE

substance + composite = BODY

body + living = ANIMATE THING

animate thing + sensitive = ANIMAL

animal + rational = MAN

B. Now:

a. The first series of predicates to be contracted by the second series is called a series of genera.

b. But the second, contracting, series is called a series of differences.

C. NOTE lastly that the series of contrahends (the first series) consists of superior concepts, which, when contracted by the differences, become inferior concepts.

105. QUESTION OF METAPHYSICAL DEGREES: Therefore the question to be solved - to wit, concerning the NATURE OF THE DISTINCTION between these predicates of the two series attributed to the same subject (Peter), - is called the question of METAPHYSICAL DEGREES:

A. It is called the question of DEGREES indeed, because it is about superior and inferior concepts by which, as BY STEPS OR DEGREES, we ascend and descend in the order of concepts.

B. And of METAPHYSICAL degrees, because it is question of metaphysical universals.

……

ARTICLE TWO.

NO DISTINCTION ON THE PART OF THING BETWEEN METAPHYSICAL DEGREES.

106. NO REAL DISTINCTION: That there is not REAL DISTINCTION between metaphysical degrees, or distinction between objects diverse on the part of the thing, independently of the consideration of the mind, is clear from what has been said above on the nature of the universal (nn. 92-97).

A. For each degree v.g. substance, body, etc, is identified with the individual, v.g. Peter, because universal exist on the part of thing as singular, i.e. identified with the individual.

a. But those which are identified with one individual, are really identified with each other.

b. And thus 'substance' and 'body' cannot be identified with Peter without substance and body being identified with each other.

B. Nor can this conclusion be denied unless it be admitted that that whereby SUBSTANCE is formally constituted really differs from that whereby corporeity, or life, or animality, or rationality, is formally constituted.

a. But, as we see in natural philosophy, there is in one nature one sole principle whereby it is formally constituted substance, and body, and living, and animal, and man.

b. Wherefore no one can sustain real distinction of metaphysical degrees, unless he:

b1. admits a plurality of formal essential principles in one nature,

b2. or denies that universals are identified with the individual.

107. OPPOSITION BETWEEN SCOTUS AND ST. THOMAS: In Scotist teaching, according to which metaphysical degrees are distinguished on the part of thing (in the real), this conclusion is connected, not with the doctrine of plurality of forms, but with the denial of identity on the part of thing of the universal and the individual.

A. Scotus affirms that this distinction on the part of thing is not real, but actual-formal.

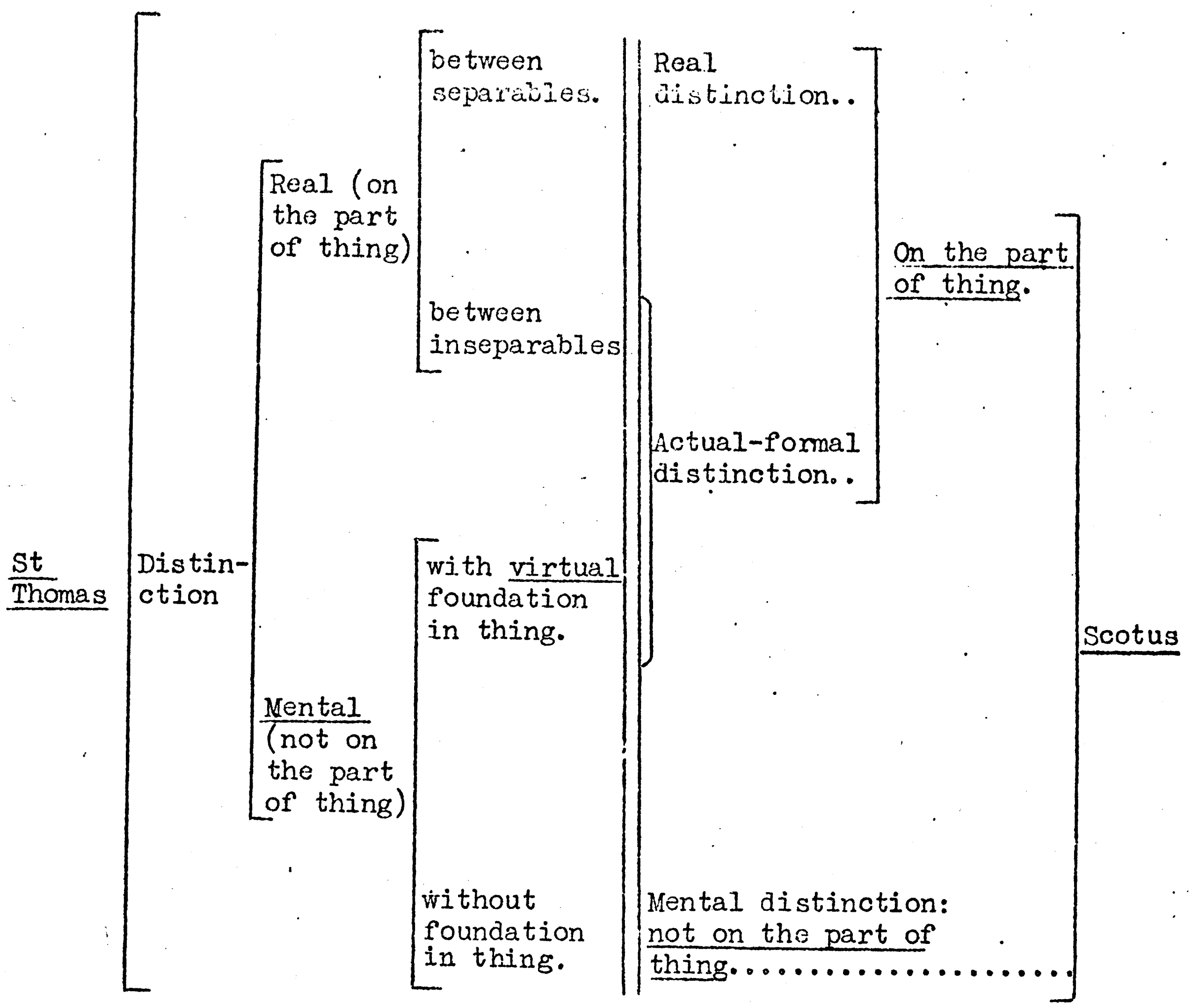
a. Scotus, IN ORDER TO SAVE HIS DOCTRINE AGAINST THE DANGER OF CONCEPTUALISM, was led to a twofold distinction on the part of thing, i.e. independently of the consideration of the mind, to wit:
a1. Real distinction between separables;
a2. And actual-formal distinction, which lies between two formalities of the same thing, or, in other words, between inseparables.

b. For, having admitted the univocity of abstract being, in order to avoid pantheism, he taught that concrete beings are analogous.
b1. He was obliged therefore to oppose the abstract order to the concrete order, or the order of being to the order of beings,
b2. But from this opposition logically follows conceptualism, which however Scotus avoided by the aid of the principle of exaggerated realism according to which there must necessarily correspond to every diversity of concepts an actual distinction in thing:
b2a. not indeed between diverse things.
b2b. but between DIVERSE FORMALITIES of the same thing.
b3. This distinction he calls ACTUAL FORMAL.

B. HOWEVER IT IS NOT TO BE THOUGHT that, because Scotus restricted real distinction to separables, we are confronted with a mere quarrel about words. In order to make it clear that the opposition between Scotus and St Thomas is not a mere difference of terminology, it will be helpful to compare briefly the doctrine of these two masters. For the Scotist doctrine of actual-formal distinction extends itself beyond the ambit of the real distinction propounded by St Thomas.

a. For:
a1. Whereas St Thomas under the name 'real distinction' intends to designate:
a1a. every distinction on the part of thing,
a1b. or, in other words, every distinction having an actual foundation in thing;
a2. Scotus,
a2a. not distinguishing between:
a2a1. ACTUAL foundation in thing, whereto corresponds real distinction,
a2a2. and VIRTUAL foundation in thing (i.e. not distinction in thing but only the power or virtue of engendering a conceptual diversity), whereto corresponds only mental distinction (distinctio rationis),
a2b. under the name of actual-formal distinction, designates:
a2b1. not only real distinction between inseparables,
a2b2. but also mental distinction with virtual foundation in thing, whereto however he attributes actual foundation in thing.
a3. Whence it is clear that the dispute is not merely about words, but is about REALITY.

b. This doctrinal diversity between Scotus and St Thomas may be thus schematically illustrated:-


St Thomas
Distinction
Real (on the part of thing)
between separables.
between inseparables
Mental (not on the part of thing)
with virtual foundation in thing.
without foundation in thing.
Real distinction..
Actual-formal distinction..
Mental distinction: not on the part of thing......................
On the part of thing.
Scotus

c. But Scotus cannot sustain this actual-formal distinction save by denying the identity on the part of thing of the universal and the individual whereof the universal is predicated.

c1. This notwithstanding - though illogically - Scotus holds that the universal is multiplied in individuals; and this in order to:

cla. save the truth of predication,

clb. and avoid monism.

c2. For if the specific nature were actually distinguished on the part of thing from the numeric difference, it is impossible to see how the nature could be numerically multiplied, since the numeric difference is the principle of the multiplicity of the specific nature.

c3. Scotus

c3a. has recourse to some principle of infra-numeric multiplicity;

c3b. but what this principle is, is scarcely intelligible.

....

ARTICLE THREE.

DISTINCTION BETWEEN METAPHYSICAL DEGREES IS OF CONCEPT, NOT OF NAME ONLY.

108. DISTINCTION OF NAME AND DISTINCTION OF CONCEPT: From this that metaphysical degrees are not distinct on the part of thing, it cannot be concluded that between them there is utter identity, so that the distinction between them would be no more than a distinction of name.

A. For, as we have said above, a term is a sign of a thing, by the medium of the concept.

a. Therefore there can be THREE distinctions, to wit:

a1. of name only; as between 'man' and 'homme'.

a2. of name and concept, as between 'man' and 'animal';

a3. of name, concept and thing, as between 'man' and 'horse'.

b. Of these distinctions:

b1. the first and second are mental distinctions (distinctiones rationis);

b2. while the third is real distinction.

c. Which may be thus illustrated schematically:-

There are three distinctions, to wit:	Of name only: as between	'man' and 'homme'	These distinctions are mental.
	Of name and concept: as between	'man' and 'animal'	
	Of name, concept and thing: as between	'man' and 'horse'	This distinction is real.

B. The distinction of metaphysical degrees pertains not to distinction of name only, but to distinction of name and concept, as is thus clear:

a. Between the concepts 'substance' and 'body' there is indeed a diversity of comprehension: for they are degrees, or, in other words, superior and inferior concepts.

b. Likewise between some predicate, (v.g. 'animal'), and its specific difference (v.g. 'rational'), there is also diversity of comprehension.

109. THIS DISTINCTION HAS A VIRTUAL FOUNDATION IN THING: However, it is to be noted that this distinction, although it is a distinction of mind, not of thing, differs from a simple distinction of name which is conventional (ad placitum) in this, that it depends upon the thing, which the comprehension of the concept represents.

A. Not indeed in the thing is the distinction found: for if it were found in the thing it would be a real distinction, not a mental distinction.

B. Yet the THING offers a foundation for a diversity of concepts, INASMUCH AS IT IS TOO PERFECT TO BE EXHAUSTED BY ONE CONCEPT OF OUR INTELLECT, which is the most imperfect of all intellects. Thus, because our intellect cannot by one single concept perfectly understand what man is, it must from that same thing which man is, abstract diverse concepts: to wit, the concepts of substance, of body, of living, of animal, or rational.

a. This distinction, lest it be confused with distinction of name only, or, in other words, with UNBASED MENTAL DISTINCTION (distinction 'ad placitum'), is called a BASED MENTAL DISTINCTION or MENTAL DISTINCTION WITH FOUNDATION IN THE REAL.

b. But to distinguish it on the other hand from REAL distinction,
- which, being itself IN THING, has an ACTUAL foundation in the real,
- it is called also a mental distinction with VIRTUAL foundation in the real: 'virtual', that is:

b1. without distinction in thing,

b2. but finding in the thing perfection which has the virtue or power of engendering many distinct concepts of this thing.

110. THIS DISTINCTION IS A MAJOR BASED MENTAL DISTINCTION: But if metaphysical degrees are compared to each other, it will be found

that the concepts whereby they are distinguished are so diverse that one (v.g. 'man') adds something objective (v.g. 'rational'), which IS NOT ACTUALLY in the superior concept (v.g. in 'animal').

A. And therefore the based mental distinction between metaphysical degrees is based on OBJECTIVE PRECISION, whereby the thing is conceived inadequately, i.e. not totally as regards all its predicates, but with the omission of some. This distinction is called a MAJOR BASED MENTAL DISTINCTION.

B. And it gets this name in order that it may be distinguished from another based mental distinction which is rightly called MINOR, because the foundation of the distinction is less.

a. For in this other based mental distinction, which is verified, for example, between a defined and its definition (v.g. between 'man' and 'rational animal'), and between a metaphysical essence and its metaphysical properties (v.g. between 'man' and 'talky', between 'God' and 'almighty', between 'being' and 'true'), there is no objective precision between the concepts, but FORMAL precision only:

b. For each of the two concepts (v.g. 'man' and 'rational animal' attains the thing according to all its predicates:
b1. but one of them ('man') attains them CONFUSEDLY,
b2. whereas the other ('rational animal') attains them DISTINCTLY.

C. In order the better to understand which, it is to be noted that PRECISION is the same as separation or distinction effectively taken.

a. For distinction can be taken:
a1. Effectively, for the very act of distinguishing;
a2. Or formally, for the very plurality itself which is the distinction or distinctness.
a3. Or relatively, for the relation which follows plurality inasmuch as those which are distinct are referred to each other as distinct.

b. But PRECISION (i.e. distinction effectively taken) is twofold, to wit:
b1. PHYSICAL precision, as when one is really separated from another, (v.g. a branch is lopped from a tree).
b2. INTENTIONAL or cognoscitive precision, which is had inasmuch as one is separated from another in understanding and by understanding. Which again is twofold, to wit:
b2a. FORMAL precision, whereby knowledge attains a whole object as regards all its predicates, yet in such fashion that one predicate is clearly and distinctly apprehended while the others are confusedly apprehended.
b2a1. Thus of the one same thing 'Peter':
b2a1a. one concept distinctly attains this predicate 'man', while it confusedly attains the other predicates such as 'animal', 'rational', 'talky', 'laughy', 'social' etc.
b2a1b. and another concept distinctly attains this predicate 'rational animal', while only confusedly does it attain the other predicates 'talky', 'laughy', 'social' etc.
b2a1c. and another concept distinctly attains this predicate 'laughy', while only confusedly does it attain the predicates 'rational animal', 'talky', 'social' etc.
b2a1d. and another concept distinctly attains this predicate 'talky', while only confusedly does it attain the predicates 'rational animal', 'laughy', 'social' etc.
b2a2. By formal precision, as is clear from what has been said above, arises the distinction which is called MINOR BASED MENTAL DISTINCTION.
b2b. OBJECTIVE precision, whereby one predicate is attained, the others being simply omitted.
b2b1. Thus of the same thing 'Peter', the concept 'animal' attains the one predicate 'animal' alone, simply omitting (not even confusedly attaining) the predicates 'man' 'rational', 'talky', 'laughy', 'social' etc.
b2b2. It is clear from what has been said above that it is by objective precision that the distinction which is called MAJOR BASED MENTAL DISTINCTION arises.

c. Therefore the diverse precisions are distinguished as thus shown schematically:

Precision is
- Either REAL: when one is really separated from another.
- or INTENTIONAL: when one is separated from another in intellect and by intellect: and this is:
  - either FORMAL: when knowledge attains a thing according to all its predicates, yet in such wise that one predicate is distinctly attained while the others are only confusedly apprehended.
  - or OBJECTIVE: when knowledge attains one predicate of a thing: its other predicates being simply omitted.

111. SCHEMATIC EXPOSITION OF THE DIVERSE DISTINCTIONS:

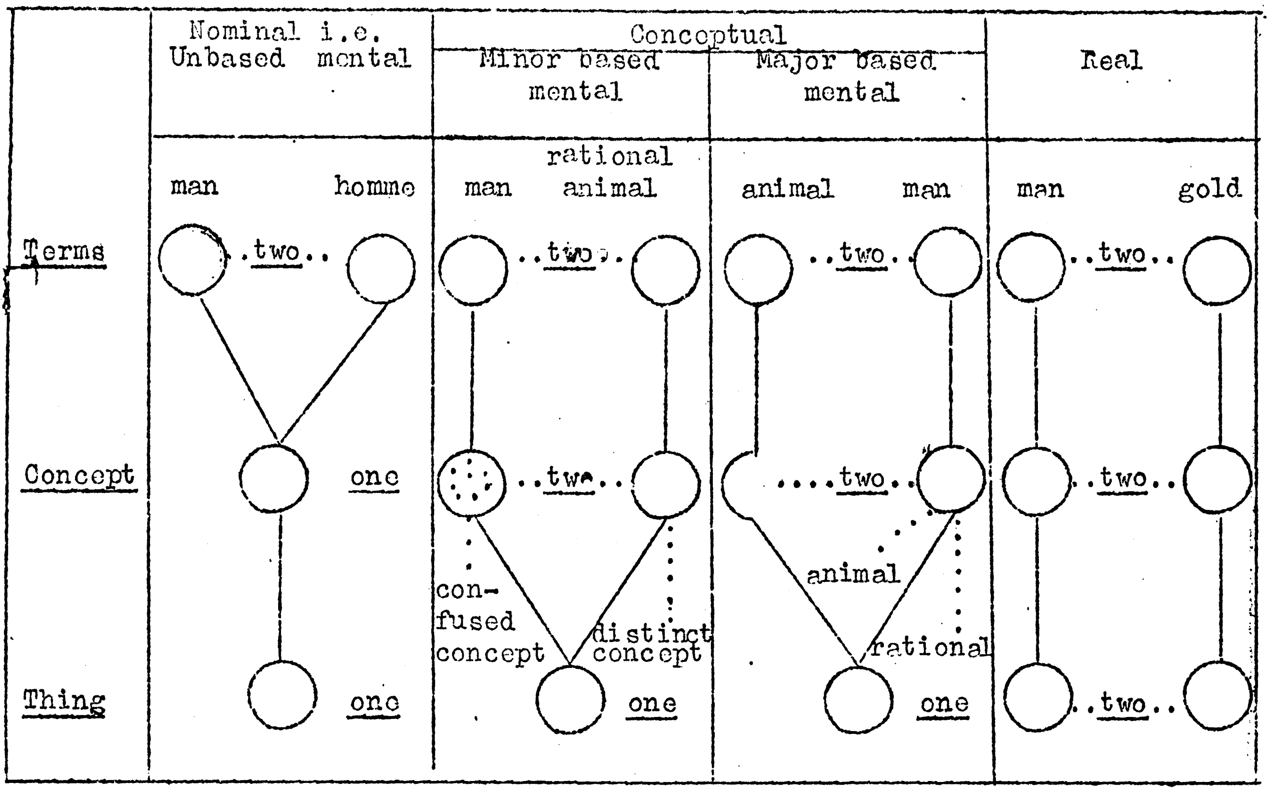
From what has been said it is clear:

A. That distinction is thus divided:-

DISTINCTION: i.e. LACK OF IDENTITY: which is
- Either MENTAL, i.e. DISTINCTION NOT EXISTING ON THE PART OF THING: which is
  - Either UNBASED:
    - Which is DISTINCTION ACCORDING TO NAME ONLY.
    - Whereof the cause is GOOD-PLEASURE.
  - Or BASED, i.e. DISTINCTION BETWEEN TWO CONCEPTS OF THE SAME THING: and this is
    - Either MINOR:
      - Which is DISTINCTION BETWEEN TWO CONCEPTS OF THE SAME THING, HAVING INDEED THE SAME ACTUAL CONTENT, BUT DIFFERING ACCORDING AS ONE BESPEAKS IMPLICITLY OR CONFUSEDLY WHAT THE OTHER BESPEAKS EXPLICITLY OR DISTINCTLY.
      - Whereof the cause is FORMAL PRECISION.
    - Or MAJOR:
      - Which is DISTINCTION BETWEEN TWO CONCEPTS OF THE SAME THING, YET HAVING DIVERSE ACTUAL CONTENT.
      - Whereof the cause is OBJECTIVE PRECISION.
- Or REAL:
  - Which is DISTINCTION EXISTING ON THE PART OF THING.
  - Which
    - is NOT CAUSED by the mind.
    - but is FOUND in the real by the mind.

B. Which may indeed be schematically illustrated in another way, thus:-

........................DISTINCTION........................



SCHEMATIC SUMMARY.

112. SCHEMATIC RECAPITULATION: The contents of the foregoing chapter may be thus schematically summarized:-

Metaphysical degrees:
- Their NOTION: Concepts of diverse degrees of universality predicated of the same subject.
- Their DISTINCTION: they are distinguished
  - not on the part of thing, and indeed
    - neither really.
    - nor actually-formally (as says Scotus).
  - but by MENTAL distinction, and indeed
    - not unbased (according to distinction of name only).
    - but BASED, and indeed
      - not minor (according to formal precision).
      - but MAJOR (according to objective precision).

....

SECTION THREE.

PREDICABILITY ITSELF IN SPECIAL.

113. ORDER OF PROCEDURE: Since predicability is the property whereby a universal nature respects inferiors:

A. When we are dealing with predicability the question occurs regarding the diverse manners in which a nature can respect inferiors.

B. But the MANNERS or MODES of predicability do not all have themselves in the same way towards their inferiors.

a. Thus, v.g. 'man' respects its inferiors, 'Peter', 'Paul' and 'James' IN THE SAME WAY, that is, to signify the same: this is called UNIVOCAL predicability.

b. But 'being' is said of 'God', of 'creature', of 'substance' and of 'accident' to signify diverse significates:

b1. Indeed it is said of:
b1a. 'God' to signify 'being FROM SELF';
b1b. 'creature' to signify 'being FROM OTHER';
b1c. 'substance' to signify 'being IN SELF';
b1d. 'accident' to signify 'being IN OTHER'.
b2. This mode of predicability is called ANALOGOUS predicability.

C. Therefore this section will treat in turn:
a. First, UNIVOCAL predicability.
b. Secondly, ANALOGOUS predicability.

D. Hence the following order:-

On predicability in itself in special: indeed:
- On univocal predicability..............Sub-section one.
- On analogous predicability.............Sub-section two.

SUB-SECTION ONE.

UNIVOCAL PREDICABILITY.

114. ORDER OF PROCEDURE: For the study of univocal predicability:

A. It is to be NOTED:

a. That predicability, though it is a property of the metaphysical universal, can be considered abstractly, or, as is said, in signified act (in actu signato), prescinding from that whereof it is the property.

b. That nevertheless it cannot be exercised independently of that whereof it is the property.

B. Therefore this sub-section will treat:
a. First, of univocal predicability IN SIGNIFIED ACT.
b. Secondly, of univocal predicability IN EXERCISED ACT.

C. Hence the following order:-

On univocal predicability
- in SIGNIFIED act..........................Chapter seven.
- in EXERCISED act..........................Chapter eight.

……

CHAPTER SEVEN.

UNIVOCAL PREDICABILITY IN SIGNIFIED ACT, OR THE PREDICABLES.

115. ORDER OF PROCEDURE: This chapter will consider:

A. Four things, to wit:
a. First, the general division of predicables.
b. Secondly, the predicables in special.
c. Thirdly, the individual.
d. Fourthly, the ordering of the predicables.

B. Hence the following order:-

On the predicables:
- General division of predicables................Article one.
- The predicables in special......................Article two.
- The individual..................................Article three.
- The ordering of the predicables................Article four.

……

ARTICLE ONE.

GENERAL DIVISION OF PREDICABLES.

116. NOTION OF PREDICABLES: Predicability, as we have said above (nn.98-100), is the very essence of the logical universal, and is a property of the metaphysical universal.

A. Therefore:
a. in dealing with predicability,
b. we must deal with its diverse modes, or the diverse mental relations of a nature to its inferiors.

B. But these DIVERSE MODES OF PREDICABILITY, or DIVERSE MENTAL RELATIONS OF A NATURE TO INFERIORS, are called the PREDICABLES.

117. THREE ESSENTIAL PREDICABLES: In the preceding chapter already, where metaphysical degrees were discussed, something was said about certain modes of predicability (n.104).

A. For there:
a. Mention was made of:
a1. CONTRAHEND concepts, v.g. 'substance', 'animal';
a2. CONTRACTING concepts, v.g. 'compound', 'rational';
a3. and CONTRACTED concepts, v.g. 'body', 'man'.
b. For:
b1. 'Substance' is contracted by 'compound' into 'body';
b2. and 'animal' is contracted by 'rational' into 'man'.

B. These concepts which thus respect inferiors (v.g. 'Paul' as befitting them, because they signify its ESSENCE in diverse ways, constitute

SO MANY predicables AS there are DIVERSE WAYS of respecting the essence of the inferior.

a. Thus, v.g. 'animal', which signifies the CONTRAHEND or DETERMINAND part of the essence, is called a GENUS;

b. But 'rational', which signifies the CONTRACTING, DETERMINING, part of the essence, is called SPECIFIC DIFFERENCE;

c. And 'man', which signifies the whole essence of Paul:

c1. is called the SPECIES.

c2. and it results from the determination of the genus ('animal') by the specific difference ('rational').

118. TWO PRAETER-ESSENTIAL PREDICABLES: But besides those three modes, there are OTHER modes in which some predicate may befit a subject.

A. Besides those attributes which essentially befit 'Peter' or 'Paul':

a. there are other attributes whereby they differ ACCIDENTALLY from each other:

b. and these are accidents CONTINGENT to their (human) nature: for if they were not contingent, but necessary, then:

b1. they would befit each of the two,

b2. and so would not distinguish them.

c. And this constitutes the fourth mode, which is PREDICABLE ACCIDENT.

B. But still other attributes are found in 'Peter' and 'Paul', which befit them:

a. although they do not belong to their essence,

b. and yet are common to them and to all men, because they are NECESSARY to their nature.

c. And this constitutes the fifth mode, which is PROPER accident.

119. FIVE PREDICABLES ONLY: Nor are there, besides those five, any OTHER predicables:

A. For the division given is complete.

B. As is clear from the following scheme:-

Some predicate IS PREDICABLE of a subject, because it represents
- its ESSENCE
  - whether as regards the part
    - determinand............GENUS.
    - determining............SPECIFIC DIFFERENCE.
  - or as regards the whole............SPECIES.
- some ACCIDENT SUPERADDED TO THE ESSENCE
  - whether flowing NECESSARILY from the very essence............PROPER
  - or CONTINGENTLY............PREDICABLE ACCIDENT.

....

ARTICLE TWO.

THE PREDICABLES IN SPECIAL.

120. CONSTRUCTION OF THEIR DEFINITIONS: Each predicable, insofar as it is a logical universal, can respect many inferiors beneath it:

A. And therefore the definition of each predicable begins with these words: "a universal respecting many":

B. To which words must be added other words bespeaking the specific difference of each predicable respectively.

121. GENUS: Since, as said above (nn.117,119), genus is a predicable to be contracted (contrahend) to constitute a species:

A. A genus respects many species beneath it.

B. Then again, it belongs to the essence, or, as it is called, the quiddity, of the species.

C. Therefore GENUS is defined: A UNIVERSAL RESPECTING AS REGARDS WHAT THEY ARE, MANY DISTINCT ACCORDING TO SPECIES - "UNIVERSALE PLURA RESPICIENS SPECIE DISTINCTA IN QUID".

a. But what genus expresses of the essence of its inferiors, will appear from the consideration of this example: "Man is an animal".

a1. The complete definition of man is 'rational animal':
a1a. The difference (rational) is not included in 'animal'; for otherwise:
a1a1. every animal would be rational,
a1a2. and there would be no brute.
a1b. Nevertheless animal has something with respect to rationality, which plant has not, to wit, potency to receive rationality.
a1c. And therefore it is said that genus is the POTENTIAL PART of a species:
a1c1. "PART" indeed, because it has not the differences;
a1c2. "POTENTIAL", because it has potency to receive them.

a2. However, notwithstanding this, man is an animal, NOT AS REGARDS A PART OF MAN ONLY, BUT AS REGARDS THE WHOLE.
a2a. For there is no real distinction between the man and the animal, as was said above, when it was question of metaphysical degrees (n.106).
a2b. Wherefore it can rightly be said that genus is a POTENTIAL WHOLE:
a2b1. "WHOLE" indeed, because it represents the whole essence of its inferiors;
a2b2. But "POTENTIAL", because it represents that whole essence indeterminately and as a determinand to be determined by the difference.

b. As regards the predicability of inferiors:
b1. Genus directly respects the species, into the definition of which it enters, (as 'animal' enters into the definition of the species 'man').
b2. But indirectly it respects the difference:
b2a. That it respects it indeed, appears from this, that it can be said that "every rational (being) is an animal".
b2b. But that it respects it only indirectly, to wit, only by the medium of the species, appears from this, that animality befits rationality only inasmuch as it is the genus of the species whereof rationality is the difference.

c. However, CARE IS TO BE TAKEN AGAINST CONFUSING direct predicability with immediate predicability (which latter is also called predicability essentially and primarily - 'per se primo').
c1. Thus:
c1a. 'Substance' and 'animal' are both predicable directly of 'man':
c1a1. yet 'animal' immediately: in other words, man is essentially and primarily (per se primo) an animal;
c1a2. but 'substance' mediately only: in other words, man is essentially but not primarily (per se sed non primo) a substance; for 'substance' is predicable of man only by the medium of several other genera (to wit, 'body' and 'animate' and 'animal').
c1b. Accordingly:
c1b1. 'Animal' is called the PROXIMATE or LOWEST genus;
c1b2. But 'substance' is called a REMOTE genus.
c2. But:
c2a. when above some remote genus there is no other genus, this genus is called the SUPREME genus.
c2b. Thus 'substance' is a SUPREME genus.

122. SPECIES: It is to be observed:

A. That since species is a predicable contracted by the specific difference:
a. species is found under genus, and therefore species may be defined:
a1. not only relatively to its inferiors, i.e. individuals,
a2. but also relatively to genus.
b. But:
b1. the former mode of defining it alone befits species AS IT IS PREDICABLE, v.g. "Peter is a man".
b2. For the latter consideration is a consideration of species AS IT IS SUBJECTED TO GENUS, and therefore thus taken it is SUBJECTIBLE: v.g. "Man is an animal".

B. Therefore SPECIES is defined as a predicable: A UNIVERSAL RESPECTING MANY INFERIORS AND BEFITTING THEM AS WHAT THEY ARE COMPLETELY - "UNIVERSALE RESPICIENS PLURA INFERIORA ET EIS CONVENIENS UT QUID COMPLETE".

C. NOTE however, that this definition befits:
a. only corporal species,
b. but not spiritual species, in which, since the specific difference is also together the numeric difference, there is in each species only one individual, according as Thomists teach that "among the angels, how many individuals there are, so many species there are - apud angelos, quot sunt individui, tot sunt species."

123 SPECIFIC DIFFERENCE: It is to be observed:

A. That difference:
a. like genus, respects one part of an essence, respecting its inferiors as regards what they are, but incompletely.
b. But:
b1. whereas genus respects the determinable part of the essence,
b2. difference respects the determining part.

B. But:
a. Since by its difference, a species has determination, the term 'quality' 'quale) is borrowed:
a1. transferring to the essence that which is properly the character of quality;
a2. for quality is properly the determinative accident.
b. And therefore DIFFERENCE is defined: A UNIVERSAL RESPECTING ITS INFERIORS AS BEFITTING THEM AS REGARDS ESSENTIAL QUALITY - "UNIVERSALE RESPICIENS SUA INFERIORA TAMQUAM CONVENIENS ILLIS IN QUALE QUID".

124. PROPER AND PREDICABLE ACCIDENT: It is to be considered:

A. Since proper and accident are qualities (sortnesses) SUPERADDED to the essence, they retain in their definitions the term 'quality' (quale), which was already used by transference in the definition of difference.

B. However:
a. The definition of proper ought to note a diversity:
a1. on the one hand, from difference,
a2. and on the other hand, from predicable accident.
b. And accordingly:
b1. The diversity from difference is indicated by the term 'accidental' in place of the word 'essential' ('accidentaliter' in place of 'quid').
b2. The diversity from predicable accident is indicated by the term 'necessary' in place of the term 'contingent' ('necessario' in place of 'contingenter').

C. Hence the definitions of the two:
a. PROPER is defined: A UNIVERSAL WHICH IS PREDICATED OF MANY AS REGARDS ACCIDENTAL BUT NECESSARY QUALITY - "UNIVERSALE QUOD PRAEDICATUR DE PLURIBUS IN QUALE ACCIDENTALITER SED NECESSARIO".
b. But ACCIDENT is defined: A UNIVERSAL WHICH IS PREDICATED OF MANY

AS REGARDS ACCIDENTAL AND CONTINGENT QUALITY - "UNIVERSALE QUOD PRAEDICATUR DE PLURIBUS IN QUALE ACCIDENTALITER ET CONTINGENTER".

D. But these terms 'necessarily' and 'contingently' must be rightly understood: for they are said relatively, not to individuals, but to species.

a. Thus:
a1. 'masculine' or 'feminine':
a1a. is indeed necessary to the individual, inasmuch:
a1a1. as it is indeed necessary to Peter that he be masculine,
a1a2. and to Mary that she be feminine.
a2. but it is not necessary to the species, inasmuch:
a2a. it is not necessary that man be masculine, since man can be feminine,
a2b. nor is it necessary that man be feminine, since man can be masculine.
a3. Wherefore 'masculine' or 'feminine' is a predicable accident. (Cf. In I Periherm. lib. I, c. 7, lect. 10, ed. Leonina, p. 48, nota).

b. But 'risible' (laughy), since it is necessary to human species, because flowing from that species, is proper. However this necessity to the species admits diverse degrees:

b1. Either it flows from the difference:
b1a. and therefore befits:
b1a1. EVERY individual of the species,
b1a2. that species ALONE,
b1a3. and ALWAYS.
b1b. Thus man is risible, by reason of his rationality (difference).
b1c. Then is had a STRICT PROPER.

b2. Or it flows from the genus:
b2a. and then it befits:
b2a1. EVERY individual,
b2a2. and ALWAYS,
b2a3. but NOT the species ALONE.
b2b. Thus 'endowed with senses' befits EVERY man and ALWAYS, but not man ALONE, because it is by reason of animality (genus) that man has senses.
b2c. Then is had a LESS STRICT PROPER.

b3. But there is still another proper, which approaches nearer to predicable accident:
b3a. And this is a proper which designates a contingent act of some proper: such as 'use speech' or 'actually speak'.
b3b. For:
b3b1. 'have speech' or 'be speechful' is a proper of man, just as is 'be risible';
b3b2. but the act of speaking is an contingent act of this proper.
b3c. And therefore it befits:
b3c1. EVERY individual of the species,
b3c2. and that species ALONE,
b3c3. but NOT ALWAYS.
b3d. And then is had a PROPER BROADLY SO-CALLED.

b4. Of these:
b4a. the first, which is the strict proper, is called a proper SIMPLY (proprium simpliciter).
b4b. But the second, which is the less strict proper, and the third, which is the proper broadly so-called, are called a QUALIFIED proper (proprium secundum quid).
b4c. Which is thus illustrated schematically:-

PROPER is taken
- either simply or as strict: and then it befits
  - every
  - alone,
  - always.
- or under qualification: and then
  - either as less strict: and then it befits
    - every,
    - always,
    - not alone.
  - or broadly: and then it befits
    - every,
    - alone,
    - not always.

E. But it is necessary to DISTINGUISH two properties, to wit, physical property and metaphysical property.

a. For a PHYSICAL property:
a1. is a "real accident consequent upon an essence"; (Goudin, Logica Major, I, disp. I, q.2, a.7).
a2. and accordingly it is really distinct from that essence.
a3. And an essence taken as opposed to its physical properties:
a3a. is the essence taken as it is in the real without any precision;
a3b. and so taken therefore includes everything that is really within it;
a3c. and therefore to it belong all metaphysical properties.
a4. Thus:
a4a. The physical essence of man is compound from specially (humanly) organized body and intellective soul;
a4b. and the physical properties of man are, for example, human intellect, human will etc, which are really distinct from that physical essence.
a5. A physical property is sometimes called also actual property

b. But a METAPHYSICAL property:
b1. is "a certain notion, only mentally distinct from the essence, or the very essence itself insofar as it is the foundation of a physical property." (Goudin, ibid.).
b2. And the essence taken as opposed to metaphysical property is the metaphysical essence:
b2a. which therefore does not include everything that is really within the physical essence; for it does not include the metaphysical properties;
b2b. and:
b2b1. though it is really identical with the metaphysical properties,
b2b2. yet is mentally distinct from them;
b2c. and:
b2c1. is the root of them,
b2c2. they being consequent - not really, but mentally - upon it;
b2d. so that:
b2d1. the metaphysical essence is the very thing as primarily conceived or understood,
b2d2. while the metaphysical properties are that same thing as consequently conceived or understood,
b3. Thus:
b3a. The metaphysical essence of man is rational animal;
b3b. and the metaphysical properties of man are 'risible' (laughy), 'flebile' (weepy), 'speechful' (talky), 'social', 'progressive', 'economic' (exchangeful), etc.
b4. Metaphysical properties are sometimes also called:
b4a. attributal properties; (Goudin, ibid.).
b4b. or aptitudinal properties; (cf. Ferrariensis in IV Con.Gent. c.65),
b4c. or radical properties; (John of St Thomas, Cursus, Philos., III, q.2, a.2).

125. RECAPITULATION AND ILLUSTRATION: Hence:

A. The definitions of the five predicables are as follows:-

Predicable: A DETERMINATE MODE OF PREDICABILITY, or A DETERMINATE MENTAL RELATION OF A NATURE TO INFERIORS: whereof there are five, and five only, to wit:

Genus:	A UNIVERSAL RESPECTING AS REGARDS WHAT THEY ARE, MANY DISTINCT ACCORDING TO SPECIES; i.e. a universal which is predicated so as to say incompletely what the subject is.
Species:	A UNIVERSAL RESPECTING MANY INFERIORS AND BEFITTING THEM AS WHAT THEY ARE COMPLETELY; i.e. a universal which is predicated so as to say completely what the subject is.
Difference:	A UNIVERSAL RESPECTING ITS INFERIORS AS BEFITTING THEM AS REGARDS ESSENTIAL QUALITY; i.e. a universal which is predicated so as to say of which sort the subject is essentially.
Proper:	A UNIVERSAL WHICH IS PREDICATED OF MANY AS REGARDS ACCIDENTAL BUT NECESSARY QUALITY; i.e. a universal which is predicated so as to say of which sort the subject is non-essentially but necessarily.
Accident:	A UNIVERSAL WHICH IS PREDICATED OF MANY AS REGARDS ACCIDENTAL AND CONTINGENT QUALITY; i.e. a universal which is predicated so as to say of which sort the subject is non-essentially and contingently.

B. Which may be thus:

a. schematically illustrated:-

INFERIOR		SUPERIOR	
SUBJECT		PREDICATE	PREDICABLE
"Man	is	an animal"........................	GENUS.
"Peter	is	a man"........................	SPECIES.
"Peter	is	rational"........................	DIFFERENCE.
"Peter	is	social"........................	PROPER.
"Peter	is	wise"........................	ACCIDENT.

b. With regard to which, note:

b1. That the proper or immediate inferiors constituting the term which GENUS "respects" (or towards which it has relation as a universal to its immediate or proper inferiors) are species.

b2. That the inferiors of (most special) SPECIES are individuals.

b3. That the inferiors of DIFFERENCE are the inferiors of the species whereof it is the difference:

b3a. For, though difference has relation to species,

b3b. yet:

b3b1. it has not to species the relation of universal to inferior,

b3b2. but the relation of convertible with convertible.

b4. That the inferiors of PROPER are the inferiors of the species whereof it is proper:

b4a. For, though proper has relation to species,

b4b. yet:
b4b1. it has not to species the relation of universal to inferior,
b4b2. but the relation of convertible to convertible.
b5. That the inferiors of ACCIDENT are individuals.

....

ARTICLE THREE.

THE INDIVIDUAL.

126. THE INDIVIDUAL IS NOT A PREDICABLE: For:

A. Just as:
a. species is subjected to genus,
b. so is the INDIVIDUAL subjected to the species.

B. But, since it is the ultimate subject,
a. of one only, to wit, of itself, is it predicable;
b. and therefore, having no inferiors, it is not a predicable or logical universal.

127. METAPHYSICAL AND PHYSICAL CONSIDERATION OF THE INDIVIDUAL: It follows that the individual is distinct from others within the same species; for otherwise it would be universal.

A. Metaphysically the individual is constituted by NUMERIC DIFFERENCE - as, so to speak, by a lowest metaphysical degree, - whereby the nature is rendered in itself singular.

a. But this numeric difference is not to be confused with the sum of contingent accidents whereby individuals are physically distinguished from each other.
a1. For the nature, which exists in the individual, is identified with it;
a2. and is therefore in itself SUBSTANTIALLY individual:
a3. wherefrom it is clear that it is not by accidents that this nature is individuated. (Cf. General Natural Philosophy, Section 2, chap.8, where the individuation of bodies is treated).

b. But we know this numeric difference, not in itself, but through its empiriological signs or, as they are called, its individuating notes.
b1. For even the specific difference of things we know in most cases, not in itself, but only negatively: as is shown by this, that we say that a brute is an IRRATIONAL animal.
b2. It is a 'fortiori' (for a still stronger reason) the same with numeric difference: for the individual is ineffable (unsayable), and indeed:
b2a. ineffable on account of its materiality, if it is question of a material individual;
b2b. but ineffable on account of its spirituality, if it is question of other individuals: for we know the spiritual only ANALOGICALLY, as is shown in Psychology.

B. But by the distinction of the individual by means of its individuating notes is obtained the physical consideration of the individual, - the only consideration accessible to us.

a. But these individuating notes, whereof the sum befits one individual only, are only predicable accidents.

b. These individuating notes are enumerated:
b1. In these verses:

"Forma, figura, locus, tempus, stirps, patria, nomen;
"Haec ea sunt septem, quae non habet unus et alter."

b2. Which may be thus translated:

"Name, country, race,
Time, figure, form and place;
There you have those seven notes,
Which are not the same in this and that."

....

ARTICLE FOUR.

ORDERING OF THE PREDICABLES.

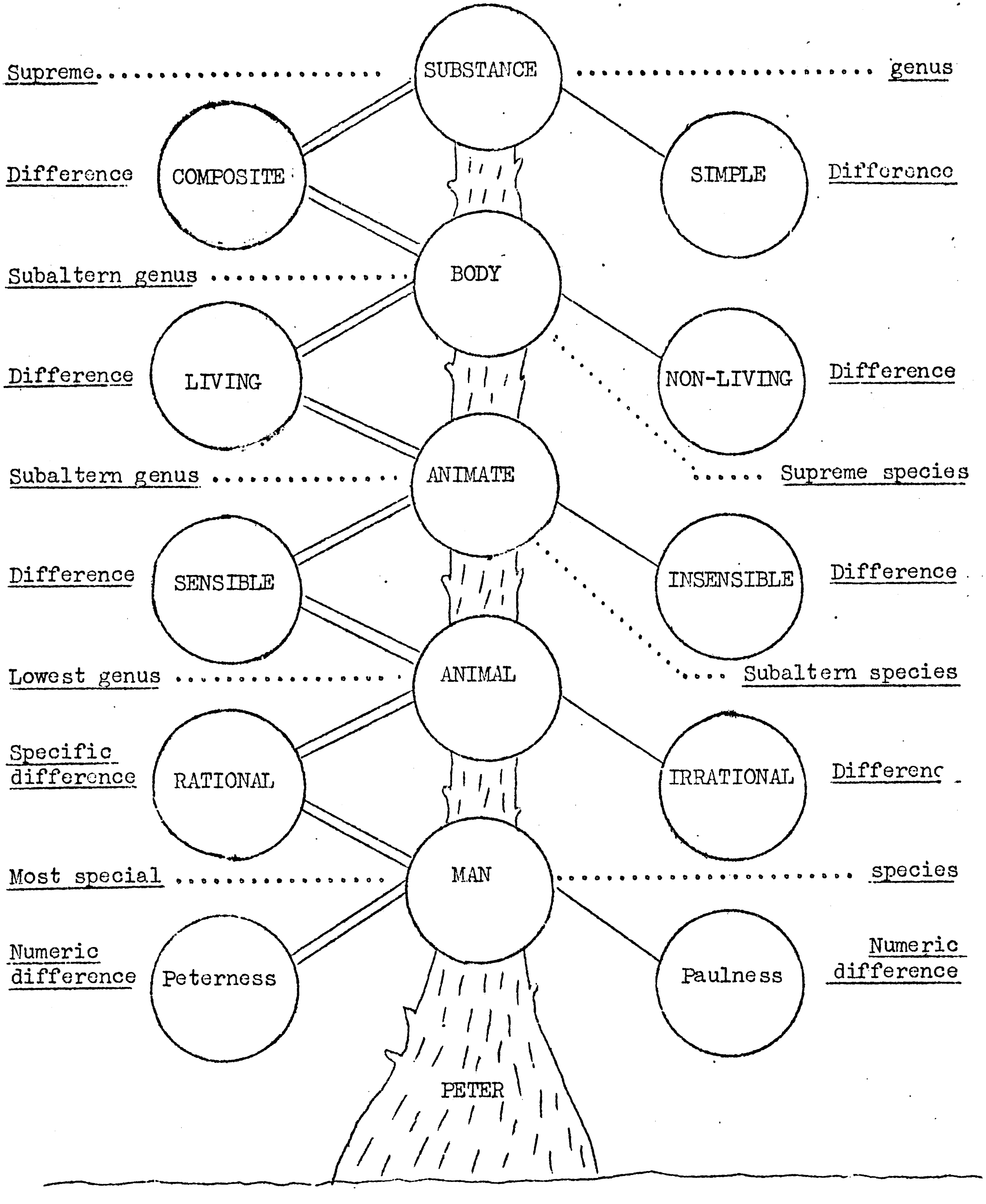
128. TREE OF PORPHYRY: In the tree of porphyry, exhibited below, is had an example of the ordering of supreme and subaltern genera, and species and differences.

A. But NOTE:

a. That, as there is shown here a tree of Porphyry in the genus of substance, so also there can in like manner be constructed trees in the other supreme genera (v.g. quantity, quality, etc), which are likewise divided in the same way by means of differences.

b. That the lowest or most special species alone is species in the strict sense: of it alone avails the definition of species given above (n.122).

B. The tree of Porphyry is as follows:-



CHAPTER EIGHT.

....

UNIVOCAL PREDICABILITY IN EXERCISED ACT, OR THE PREDICAMENTS.

129. ORDER OF PROCEDURE: It is to be observed carefully:

A. That the PREDICABLES, which are mental beings of second intention (cf. n.11.B), are based on beings of the first intention or REAL beings. But of these real beings wherein the predicables are based, it was not question in the preceding chapter, which considered the relation of predicability of predicate to subject in the abstract.

B. But, dealing with univocal predicability in the concrete:
a. We must enquire:
a1. What can EXERCISE the office of predicable?
a2. that is: Which are the METAPHYSICAL UNIVERSALS, or real beings, which can be predicated of a subject by way of genus, of species, of difference, of proper, and of predicable accident?
b. These real beings, which are thus univocally predicable in exercised act of their inferiors, are called the PREDICAMENTS or CATEGORIES.

C. Of these we now treat:

a. Dealing:
a1. First, with their nature.
a2. Secondly, with their division.
a3. Thirdly, with their properties - called the post-predicaments.

b. Hence the following order:-

On the predicaments
Their nature..........................Article one.
Their division........................Article two.
Their properties......................Article three.

....

ARTICLE ONE.

NATURE OF THE PREDICAMENTS.

130. NATURE OF THE PREDICAMENTS: If it be said: 'Peter is a substance', 'Paul is a man', 'Whiteness is a colour', 'James is big', 'God is the Creator', the predicates, considered in themselves, according as they are METAPHYSICAL universals, represent REAL natures. But among these universals we find diverse relations.

A. 'Substance' and 'man' are to each other as superior and inferior concepts:
a. For relatively to 'substance', 'man' is inferior:
a1. for the concept 'man' contains in itself the concept 'substance',
a2. nor have the two the same extension, since not every substance is a man.
b. They both belong to the same category, to wit, that of substance.

B. But the other predicates, to wit, 'colour', 'creator', 'big':
a. have not the relation of superior and inferior concepts,
b. and are said to belong to diverse CATEGORIES of beings: and indeed:
b1. 'colour' to the category of QUALITY;
b2. 'creator' to the category of EFFICIENT CAUSE,
b3. 'big' to the category of QUANTITY.

C. But each category gets the name of a supreme predicate:
a. Thus we have said that 'man' BELONGS to the category of SUBSTANCE;
b. and 'colour' to the category of QUALITY.

D. These categories are called PREDICAMENTS. But they can be considered in two ways:

a. In substance, in quality, and in efficient cause:
a1. we can consider, just as in man, in colour, and in creator, the REALITY which they represent:
a2. and thus they are metaphysical universals or real beings.
a3. Under this aspect, or according as it is taken IN ITSELF, a PREDICAMENT is nothing other than a METAPHYSICAL UNIVERSAL.

b. But substance, or quality, or quantity:
b1. if it is considered RELATIVELY TO INFERIORS (v. g. to 'man', or 'colour', or 'bigness'), or under a logical aspect:
b1a. then it is a LOGICAL UNIVERSAL,
b1b. and it is nothing other than one of the supreme genera of beings,
b1c. or designates one predicable but ACCORDING AS PREDICABILITY IS EXERCISED BY SOME DETERMINATE BEING.
b2. Wherefrom it appears that this treatise on the predicaments, according as it is here considered by the logician, is concerned about predicability IN EXERCISED ACT.
b3. And it also appears:
b3a. that the name 'category' better designates this logical aspect,
b3b. while the name 'predicament', which is more frequently used to designate both aspects, is more fitting to designate the absolute (or metaphysical) consideration of the metaphysical universal.

131. DIVERSE WAYS OF BELONGING TO A PREDICAMENT: All real beings belong to the predicaments. But diversely:

A. Beings:
a. which are contained beneath a supreme genus:
a1. after the manner of a subaltern genus.
a2. or of a species,
a3. or of an individual,
b. or, in other words, beings which are allocated on the straight or central line (the trunk) of a Porphyrian tree,
c. belong DIRECTLY to a predicament.

B. But in two ways may a being belong directly to a predicament, to wit, either non-reductively or reductively:
a. NON-REDUCTIVELY indeed belong complete beings, such as 'animal' or 'man', for these are found explicitly on that straight line.
b. But REDUCTIVELY belong incomplete beings, such as 'matter' and 'soul', which are found indeed on that line, but only inasmuch as they are contained implicitly in 'body' and 'animal'.

C. But those which are found on the laterial line (on a branch) of a Porphyrian tree, such as DIFFERENCES, belong only INDIRECTLY or LATERALLY to a predicament, because they can be predicated indirectly of those beings which belong to the straight line.

D. But complex concepts:
a. since they contain several essences,
b. pertain to several predicaments.
c. Thus 'philosopher':
c1. which bespeaks two essences, to wit:
c1a. 'man',
c1b. and 'philosophical science',
c2. pertains to two predicaments, to wit:
c2a. to substance,
c2b. and to quality.

E. Hence the following scheme:-

Some being may belong to a predicament
- either DIRECTLY, and then
  - either NON-REDUCTIVELY.
  - or REDUCTIVELY.
- or INDIRECTLY or LATERALLY.

……

ARTICLE TWO.

DIVISION OF THE PREDICAMENTS.

132. ORDER OF PROCEDURE: In dealing with the division of the predicaments:

A. We shall expose:
a. First, the ante-predicaments.
b. Secondly, the very division of the predicaments.

B. Hence the following order:-

On the division of the predicaments
- The ante-predicaments.............Dissertation one.
- The division itself...............Dissertation two.

……

DISSERTATION ONE.

THE ANTE-PREDICAMENTS.

133. NOTION OF ANTE-PREDICAMENTS: Before the division of real being into the predicaments:

A. There are several things which must be premised, since they are necessary for a right distinction and ordering of the predicaments.

B. These PRE-AMBLES AND PRE-REQUISITES TO THE ORDERING OF THE PREDICAMENTS are called ANTE-PREDICAMENTS.

134. FIRST ANTE-PREDICAMENT: Let us take these concepts: 'man', 'Peter', 'Philosopher', 'colour', 'paternity' and 'similitude', all of which concepts signify some reality, and so are real beings.

A. But:
a. Of each of these 'being' is said according to a signification essentially diverse, but in a secondary fashion the same, or ANALOGICALLY.
b. Of 'Peter' 'man' is said according to a same signified character, or UNIVOCALLY.
c. 'Colour', 'paternity' and 'man' are distinguished from each other according to signified characters utterly diverse, or EQUIVOCALLY.
d. Yet one can be said of another, as 'colour' or 'paternity' of 'man' or of 'Peter', as an ACCIDENT of 'man' or of 'Peter'; and it is called a DENOMINATIVE.

B. Therefore in the division of the predicaments these are to be distinguished:
a. Between superior and inferior concepts: UNIVOCITY.
b. Between diverse predicaments towards each other: EQUIVOCITY.
c. Between diverse predicaments and being: ANALOGY.

d. Between accidental predicates and those whereof they are predicated: DENOMINATION.

C. Something further regarding denomination is here in place:
a. A denominative:
a1. is an ACCIDENTAL predicate:
a1a. signifying in concrete,
a1b. that which the predicament, wherefrom it is derived, signifies in abstract.
a2. Thus 'Peter':
a2a. is denominated 'father',
a2b. (which is concrete),
a2c. from 'fatherhood', which abstractly signifies a relation of causality of the predicament of RELATION.
b. A denominative:
b1. must be an accidental predicate;
b2. for otherwise:
b2a. it would not be denominative,
b2b. but:
b2b1. would belong to the same predicament as the subject whereof it is predicated,
b2b2. and would be predicated of it:
b2b2a. either directly as a genus or a species,
b2b2b. or indirectly as a specific difference.
c. Therefore:
c1. a denominative is predicated in the concrete,
c2. for abstracts are essential predicates.

D. Thus:
a. is had the FIRST ANTE-PREDICAMENT.
b. which is the DISTINCTION OF UNIVOCALS, EQUIVOCALS, ANALOGUES AND DENOMINATIVES.

135. SECOND ANTE-PREDICAMENT: All the examples above given (n.134), except one ('philosopher'), have this common, that they express ONE essence only.

A. But in the division of the predicaments it is necessary to distinguish:
a. complex concepts,
b. and incomplex concepts (n.49).

B. But:
a. Since a predicament is a metaphysical universal,
b. for the ordering of universals, complex concepts must be reduced to several simple concepts.
c. Thus 'philosopher' expresses two realities (note that we say 'two realities', not 'two concepts'): for it signifies:
c1. 'man', which is of the predicament of substance;
c2. and 'habit of philosophy', which is of the predicament of quality.

C. Thus:
a. is had the SECOND ANTE-PREDICAMENT,
b. which is the DISTINCTION OF COMPLEX AND INCOMPLEX.

136. THIRD ANTE-PREDICAMENT: Let us take two of the above examples (n.134), to wit, 'man' and 'Peter':

A. These indeed:
a. Have this common, that they belong to the predicament of SUBSTANCE, that is, to the predicament of those things which are in self, - not in other.
b. But these concepts are distinguished from each other in this:
b1. that 'man' can be predicated OF MANY, because it is universal;
b2. whereas 'Peter' CANNOT be predicated of many, because it is singular.

B. Wherefore:

a. It is necessary to distinguish:

a1. those which are NOT IN a subject but are predicated OF a subject: such as 'man':

a2. from those which ARE NOT IN a subject and ARE NOT PREDICATED OF A SUBJECT: such as 'Peter'.

b. That is, substances, which are NOT IN a subject, must be distinguished, according as they are:

b1. either universal: these are said OF a subject;

b2. or singular; these are NOT said OF a subject.

C. But from these are to be distinguished 'colour' and 'paternity', which indeed:

a. can be predicated OF A SUBJECT, because they are universals;

b. and ARE IN a subject, because they are accidents: for a man is said to be coloured or a father inasmuch as colour and fatherhood have in the man a subject of inhesion.

D. But from these is to be distinguished that WHICH IS IN A SUBJECT (since it is an accident) YET IS NOT PREDICATED OF A SUBJECT:

a. Let us take this example: 'This green is pale':

b. 'THIS green':

b1. is IN a subject, v.g. in a leaf;

b2. yet it is NOT predicated OF any subject, because it is singular.

c. On the other hand, 'pale':

c1. in IN a subject, to wit, in a leaf;

c2. and is predicated OF a subject, to wit, of 'this green', because it is universal.

E. Which may be thus schematized in abbreviation:-

It is necessary to distinguish between those things which are	not IN	but OF....v.g. man............UNIVERSAL	SUBSTANCE	Being
		nor OF....v.g. Peter..........SINGULAR		
	IN	and OF.......v.g. colour.........UNIVERSAL	ACCIDENT	
		but not OF...v.g. this green.....SINGULAR		

F. Thus:

a. is had the THIRD ANTE-PREDICAMENT,

b. which is the DISTINCTION OF THOSE THINGS WHICH ARE IN A SUBJECT AND THOSE THINGS WHICH ARE SAID OF A SUBJECT.

137. FOURTH ANTE-PREDICAMENT: Let us take this example: 'A body is an extended substance'.

A. That which is predicated of 'body', can be predicated of its inferiors, v.g. of 'animal'.

a. For the inferior:

a1. contains the superior,

a2. and therefore, whatever is true of the superior is true of inferior also.

b. The same is to be said whenever predication is made about some subalternating genus, i.e. about some superior genus on the trunk of the same Porphyrian tree.

c. Wherefore there is consequence in these argumentations:-

c1. "An animal is a body.
But a body is an extended substance.
Therefore an animal is an extended substance."

c2. "Triangle is a shape.
But shape is a quality.
Therefore triangle is a quality."

d. Whence this FIRST ANTE-PREDICAMENTAL RULE: WHEN SOMETHING IS PREDICATED OF SOME SUBJECT, WHATSOEVER THINGS ARE SAID OF THE PREDICATE, ARE SAID OF THE SUBJECT.

B. But let us take these examples: 'vital, corporeal, SUBSTANCE', and 'vital, corporeal, QUALITY':

a. These differences, 'vital' and 'corporeal', as they divide both 'substance' and 'quality' are as regards name only the same in each case.

b. For quality is not subalternated to substance, or, in other words, does not pertain to the same direct line or trunk.

c. Whence this SECOND ANTE-PREDICAMENTAL RULE: OF GENERA OF WHICH ONE IS NOT SUBALTERNATED TO THE OTHER, THE ESSENTIAL DIFFERENCES ARE NOT THE SAME.

C. Thus:

a. is had the FOURTH ANTE-PREDICAMENT:

b. which is THE DISTINCTION OF THOSE THINGS WHICH BELONG TO THE DIRECT LINE OF THE PREDICAMENTS AND OF THOSE WHICH BELONG TO A LATERAL LINE.

138. REASON OF THE ANTE-PREDICAMENTS: From what has been said, it is easily gathered that:

A. The reason of the FIRST ante-predicament is that the predicaments must be so ordered that:

a. being may be said analogically of them;

b. within them, superiors may be said univocally of inferiors;

c. what is on the direct line in one predicament may be only equivocally named by the same name as what is on the direct line in another predicament;

d. one predicament denominates another or one is denominated from another.

B. The reason of the SECOND ante-predicament is that the predicaments must be so ordered that diverse essences may be ordered as diverse.

C. The reason of the THIRD ante-predicament is that the predicaments must be so ordered that:

a. one of the predicaments may be substance, and the others accidents;

b. and in each predicament things may be ordered according to predication and subjection, beginning from the more universal and descending right to singulars.

D. The reason of the FOURTH ante-predicament is that the predicaments must be so ordered as to dispose:

a. both genera and species, which constitute the direct line of the predicament,

b. and differences - divisive of genera and constitutive of species, - which constitute the lateral line.

....

DISSERTATION TWO.

THE VERY DIVISION OF THE PREDICAMENTS.

139. PRINCIPLE OF THE DIVISION: The principle of the division of being into predicaments is thus rightly stated by St Thomas:

A. "Otherwise is divided an equivocal, an alalogue and a univocal:

a. "An EQUIVOCAL is divided ACCORDING TO THINGS SIGNIFIED;

b. "A UNIVOCAL ACCORDING TO DIFFERENCES;

c. "but an ANALOGUE is divided ACCORDING TO MODES:

B. "Therefore:
a. "since being is ANALOGICALLY predicated of ten genera,
b. "it is divided into them ACCORDING TO DIVERSE MODES,
c. "wherefore to each genus is due a proper mode of predicating."
(In V Metaphys. lect.9, ed. Cathala, n.899).

140. THE DIVISION: A predicate may have itself in diverse ways towards a subject.

A. Let us take these examples: 'Man is an animal', 'Albert is a man'.
a. Here:
a1. 'animal' is THAT WHICH IS man.
a2. 'man' is THAT WHICH IS Albert.
b. Each predicate signifies the SUBSTANCE of the subject.
c. Wherefore the first predicament is SUBSTANCE:
c1. which is defined: A METAPHYSICAL UNIVERSAL, or REAL BEING, WHERETO BEFITS BE IN SELF AND NOT IN OTHER.
c2. Which is thus explained by St Thomas: "Substance has two proper characteristics:
c2a. "The first of which is that it does not need an extrinsic foundation wherein to be sustained, but it is sustained in itself, and therefore is said to subsist, as it were, existing through itself (per se) and not in another;
c2b. "but the other is that it is the foundation to accidents, sustaining them, and for so much it is said to stand under (substare)." (De Pot. q.9, a.1).

B. But if we take these examples: 'Peter is big', 'Peter is wise', 'Peter is a father':

a. Then the predicates are taken according to what IS IN the subject, or according to that which is an ACCIDENT of the subject.

b. And so ACCIDENT is defined: THAT WHERETO BEFITS BE IN ANOTHER AS IN A SUBJECT.

c. But an accident may come to a subject in diverse ways:

c1. The 'bigness':
c1a. comes to Peter:
c1a1. by reason of MATTER; for if Peter were a spirit, he could not be said to be 'big';
c1a2. yet it is not identified with matter; for, if it were identified therewith, since there is matter in every man, no man would be small.
c1b. Wherefore QUANTITY, whereby Peter is big, is defined: AN ACCIDENT BESTOWING UPON A SUBJECT THAT IT HAVE PARTS OUTSIDE PARTS AS REGARDS ITSELF.

c2. But the 'wisdom' also befits Peter accidentally:
c2a. but by reason of his FORM, or, in other words, by reason of that whereby he is man;
c2a1. for wisdom is an intellective quality;
c2a2. but intellect is a quality flowing from the rationality of man.
c2b. Wherefore QUALITY is defined: AN ACCIDENT MODIFICATIVE OR DETERMINATIVE OF SUBSTANCE IN ITSELF.

c3. Let us now take the predicate 'father':
c3a. Whereas quantity and quality are in substance WITHOUT RESPECT TO ANOTHER,
c3b. it is otherwise with 'fatherhood' whereby Peter is a father:
c3b1. for no man is a father save through respect to another, to wit, to a son (or daughter);
c3b2. and in this essentially consists fatherhood, which is some respect to another.
c2c. This pertains to the predicament of RELATION, which is: A REAL ACCIDENT, WHEREOF THE WHOLE BE IS HAVE SELF TOWARDS OTHER.

c4. But:
c4a. The accidents:
c4a1. mentioned so far:

c4a1a. not only are in the subject,
c4a1b. but are predicated of the subject by reason of this inhesion.
c4a2. And of all accidents:
c4a2a. the same is to be said as regards inhesion to a subject, for they all inhere therein;
c4a2b. but not as regards predication of the subject.
c4b. Let us take these examples: 'Peter is clothed', 'Peter is twenty years of age', 'Peter is in the room', 'Peter is sitting', 'Peter cuts the bread', 'Peter is being struck by Paul':
c4c. In all these examples:
c4c1. Peter is affected IN DIVERSE WAYS, i.e. some accident IS IN Peter,
c4c2. but each accident is predicated of Peter BY REASON OF SOMETHING WHICH IS OUTSIDE PETER: to wit, from clothes, from time, from place, etc.

c5. In the first example, 'Peter is clothed':
c5a. The predicate is predicated of the subject by reason of SOMETHING EXTRINSIC WHICH DOES NOT MEASURE the subject (Peter) but is measured by it.
c5b. Then is had the predicament HABIT,
c5c. which is: AN ACCIDENT RESULTING IN THINGS FROM CIRCUMSCRIPTION OF CIRCUMAMBIENT THINGS.

c6. But it is otherwise with the three following examples; for in these the predicate is predicated of the subject by reason of SOMETHING EXTRINSIC WHICH MEASURES the subject (Peter).

c7. In the first of these examples, 'Peter is twenty years of age'.
c7a. there is in Peter some accident, to wit, duration,
c7b. which is predicated of Peter BY REASON OF SOME EXTRINSIC MEASURE, that is, OF TIME.
c7c. To which corresponds the predicament WHEN,
c7d. which is defined: AN ACCIDENT RESULTING IN THINGS FROM THIS THAT THEY ARE IN TIME AS MEASURED BY IT.

c8. But in the next two examples this extrinsic measure is PLACE, to which correspond two predicaments.

c9. In the former of these two examples, 'Peter is in the room':
c9a. Peter is circumscribed BY A PLACE (the room) WITHOUT THE POSITION OF PETER'S BODY RELATIVELY TO THE PLACE BEING DETERMINED.
c9b. In which case is had the predicament WHERE,
c9c. which is defined: AN ACCIDENT RESULTING IN A BODY FROM THE CIRCUMSCRIPTION OF CIRCUMAMBIENT PLACE, THE ORDER OF PARTS IN THE PLACE NOT BEING CONSIDERED.

c10. But in the latter of those two examples, 'Peter is sitting':
c10a. There IS DETERMINED THE POSITION OF THE PARTS of Peter's body relatively to the parts of the place.
c10b. Then is had the predicament POSTURE (SITUS),
c10c. which is defined: AN ACCIDENT DISPOSING THE PARTS OF A BODY IN PLACE, or ORDER OF PARTS IN PLACE.

c11. In the last two examples, 'Peter cuts the bread' and 'Peter is being struck by Paul':
c11a. The predicates are predicated of Peter BY REASON OF SOMETHING WHICH IS TOGETHER IN THE SUBJECT AND OUTSIDE THE SUBJECT:
c11b. For the action of cutting is together in Peter and in the bread, and similarly the striking is together in Peter and in Paul:
c11c. but otherwise in the two cases:
c11c1. for the action of cutting is:
c11c1a. in Peter AS REGARDS ITS PRINCIPLE,
c11c1b. but in the bread AS REGARDS ITS TERM;
c11c2. whereas the striking is:
c11c2a. outside the subject (Peter), to wit, in Paul, AS REGARDS ITS PRINCIPLE,
c11c2b. but in the subject (Peter) AS REGARDS ITS TERM,
c11d. Whence:
c11d1. is had the predicament ACTION, which is: AN ACCIDENT WHEREBY AN EFFICIENT CAUSE ACTUALLY CAUSING PRODUCES AN EFFECT UPON ANOTHER.

c1ld2. and the predicament PASSION, which is: AN ACCIDENT THROUGH WHICH A SUBJECT IS CONSTITUTED ACTUALLY RECEIVING AN EFFECT FROM AN AGENT.

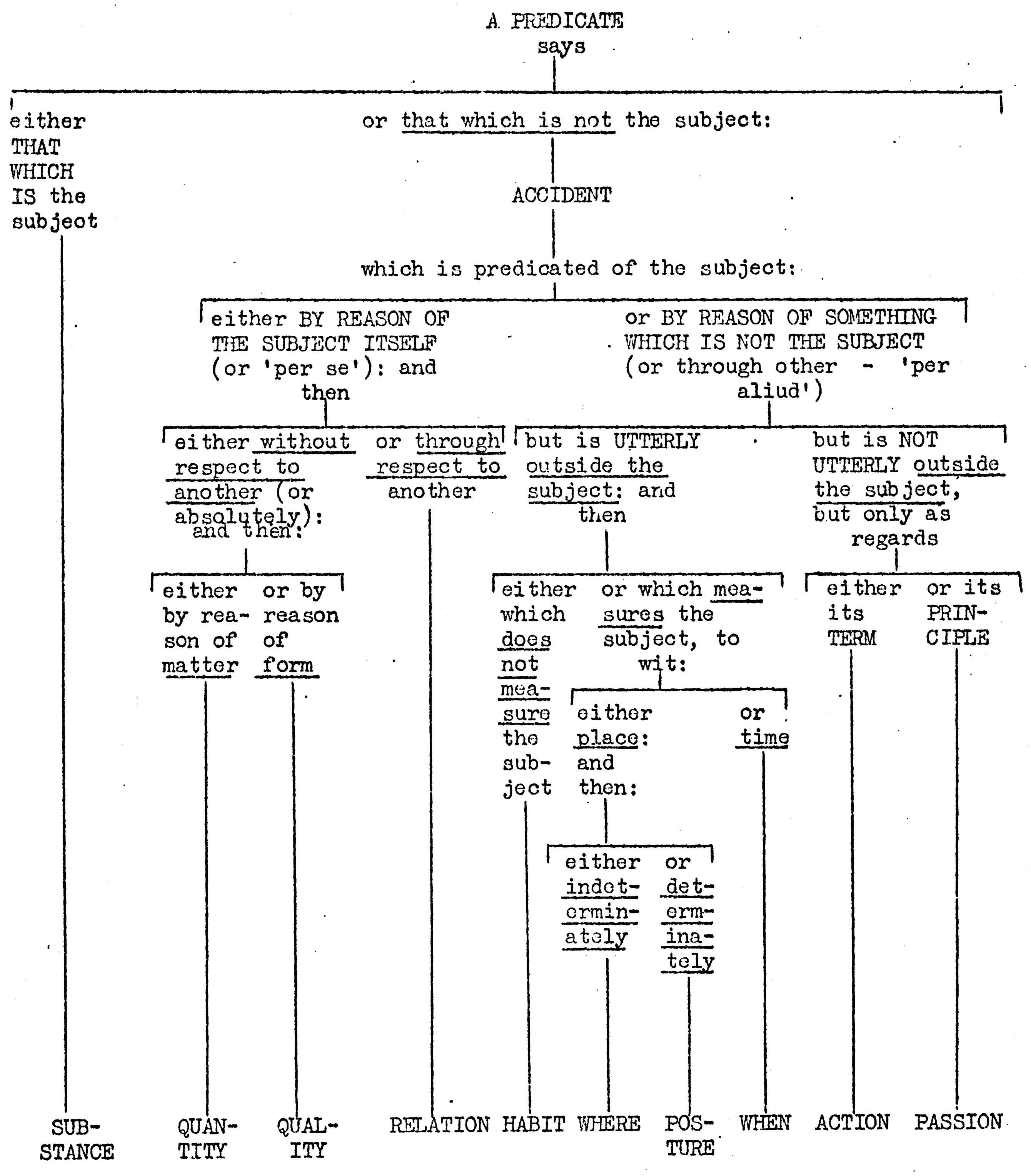
C. What has been explained is thus summarily said by St Thomas who in the following fashion deduces the ten predicaments: "A predicate may have itself to a subject in three ways:

a. "In one way, when it is THAT WHICH IS the subject, as when I say: 'Socrates is an animal'. For Socrates is that which is an animal. And this predicate is said to signify FIRST SUBSTANCE, which is a particular substance, whereof everything is predicated.

b. "In a second way, that the predicate be taken according to what IS IN the subject:
b1. "which is in (it) either BY ITSELF AND ABSOLUTELY:
b1a. "as FOLLOWING UPON THE MATTER, and thus it is QUANTITY,
b1b. "or as FOLLOWING UPON THE FORM, and thus it is QUALITY;
b2. "or is in (it), not absolutely, but IN RESPECT TO ANOTHER, and thus it is TOWARDS SOMETHING (RELATION).

c. "In a third way, that the predicate be taken from that which IS OUTSIDE the subject; and this in two ways:
c1. "In one way, that it be UTTERLY outside the subject:
c1a. "which indeed, if it IS NOT THE MEASURE of the subject, is predicated by way of HABIT, as when I say: 'Socrates is booted, clothed.'
c1b. "But if it IS THE MEASURE of it, since extrinsic measure is either time or place, the predicament is taken:
c1b1. "either on the part of TIME, and thus it will be WHEN,
c1b2. "or on the part of PLACE:
c1b2a. "and thus it will be WHERE, the order of parts in the place not being considered:
c1b2b. "which being considered, it will be POSTURE (SITUS).
c2. "In the other way, that that wherefrom the predicate is taken BE ACCORDING TO SOMETHING IN the subject whereof it is predicated.
c2a. "And if indeed according to PRINCIPLE, thus it is predicated as DO, for the principle of action is in the subject.
c2b. "but if according to TERM, thus it is predicated as SUFFER, for passion is terminated at the suffering subject." (In V Metaphys. lect. 9).

D. This division into ten predicaments is ADEQUATE, as is evident from the following scheme:-


A PREDICATE says
either THAT WHICH IS the subject
or that which is not the subject:
ACCIDENT
which is predicated of the subject:
either BY REASON OF THE SUBJECT ITSELF (or 'per se'): and then
or BY REASON OF SOMETHING WHICH IS NOT THE SUBJECT (or through other - 'per aliud')
either without respect to another (or absolutely): and then:
or through respect to another
but is UTTERLY outside the subject: and then
but is NOT UTTERLY outside the subject, but only as regards
either by reason of matter
or by reason of form
either which does not measure the subject
or which measures the subject, to wit:
either its TERM
or its PRINCIPLE
either place: and then:
or time
either indeterminately
or determinately
SUBSTANCE
QUANTITY
QUALITY
RELATION
HABIT
WHERE
POSTURE
WHEN
ACTION
PASSION

....

ARTICLE THREE.

PROPERTIES OF THE PREDICAMENTS, OR THE POST-PREDICAMENTS.

141. NATURE OF THE POST-PREDICAMENTS: The post-predicaments are certain characters pertaining to all or several predicaments, - as it were properties common to all or to several.

142. DIVISION OF POST-PREDICAMENTS: Five post-predicaments are enumerated:

A. To wit:
a. Opposition;
b. Before or prior (prius);
c. Together (simul);
d. Movement;
e. and have.

B. Four of these:
a. to wit:
a1. opposition,
a2. before,
a3. together,
a4. and have,
b. express the relation of predicaments to each other, and so regard all the predicaments.
c. Nevertheless, they are to be taken:
c1. not formally, for the very relations themselves, - for thus taken they would belong to the predicament of relation;
c2. but fundamentally, i.e. for the foundations of the relations, or, in other words, for the very predicaments themselves according as they found relation to each other.

C. The other, to wit, movement or change:
a. Of itself (per se) regards four predicaments only,
b. to wit:
b1. substance - according as movement is corruption-generation;
b2. quantity - according as movement is increase or decrease;
b3. quality - according as movement is alteration;
b4. where - according as movement is translocation.

143. OPPOSITION: Concerning opposition, it is sufficient here to note:

A. That OPPOSITION is THAT RELATION OF MANY BETWEEN THEMSELVES BY VIRTUE WHEREOF THEY CANNOT BE TOGETHER IN THE SAME UNDER THE SAME RESPECT.

B. That opposition is divided:
a. into NEGATIVE, which is:
a1. either CONTRADICTORY,
a2. or PRIVATIVE;
b. and POSITIVE, which is:
b1. either CONTRARY,
b2. or RELATIVE.

C. Concerning opposition indeed something has been said earlier. (n.57.C.).

144. PRIORITY: Regarding priority (before-ness), it is enough here to note that:

A. Priority is defined: MODE WHEREBY ONE PRECEDES ANOTHER.

B. Priority is divided into five priorities, which are thus explained:

a. Take this example: 'The fourteenth day of April is before the fifteenth.'
a1. This is called priority OF TIME,
a2. which is: PRIORITY ACCORDING TO WHICH SOMETHING PRECEDES ANOTHER ON THE SCORE OF DURATION.

b. And this example: 'Animal is before man'.
b1. This is called LOGICAL priority or priority ACCORDING TO CONSEQUENCE OF BE,
b2. which is: PRIORITY ACCORDING TO WHICH SOMETHING IS SO INFERRED FROM ANOTHER, THAT THIS IS NOT INFERRED FROM IT.

And this example: 'Peter is seated in the class before Paul in regard to place.'
c1. This is called PRIORITY OF ORDER OR OF POSITION,
c2. which is: PRIORITY ACCORDING TO WHICH SOMETHING PRECEDES ANOTHER RELATIVELY TO THE PRINCIPLE OF AN ORDER.

d. And this example: 'A bishop is before a priest.'
d1. This is called PRIORITY OF DIGNITY OR OF AUTHORITY,
d2. which is: PRIORITY ACCORDING TO WHICH ONE PRECEDES ANOTHER IN REGARD TO DIGNITY OR AUTHORITY.

e. And this example: 'Cause is before effect.'

e1. This is called PRIORITY OF NATURE or PRIORITY ACCORDING TO CAUSALITY,

e2. which is: PRIORITY ACCORDING TO WHICH ONE PRECEDES ANOTHER ACCORDING TO CAUSALITY.

e3. This priority:

e3a. is of the greatest moment,

e3b. and is not to be confused with priority of time:

e3b1. For it exists between cause and effect,

e3b2. and it bespeaks DEPENDENCE of effect upon cause.

e4. IT IS TO BE NOTED:

e4a. that a cause, as it is actually causing, is never before the become of the effect by priority of time: for they are together according to time;

e4b. but a cause is always before its effect, by priority of nature: for the effect depends upon the cause.

e5. IT IS TO BE NOTED ALSO that:

e5a. since in this priority cause and effect must be taken formally, i.e. as actually causing, or as actually caused,

e5b. this priority admits reciprocity between two which are causes to each other but in a diverse genus of causality; as when, for example:

e5b1. the dryness of the field causes the ditch in the genus of final causality, and therefore according to final causality is before the ditch,

e5b2. whereas the ditch causes the dryness of the field in the genus of efficient causality, and therefore according to efficient causality is before the dryness.

145. TOGETHERNESS: Togetherness is sufficiently explained thus:

A. It is: NEGATION OF PRIORITY AND POSTERIORITY (i.e. of beforeness, and afterness).

B. Wherefore it is divided into as many members as is priority: accordingly are to be distinguished:

a. Togetherness of TIME (simultaneity of time), which is between those which exist together at the same instant.

b. Togetherness of CONSEQUENCE, which is between those which mutually infer each other, - as rational and risible.

c. Togetherness of ORDER or of POSITION.

d. Togetherness of DIGNITY or of AUTHORITY.

e. Togetherness of NATURE, which is between those which mutually infer each other, so, however, that one is not the cause of the other: as is the case with correlatives, such as brothers or sisters.

146. HAVE: Concerning 'have' it is sufficient to note that:

A. Have is defined: A MANNER ACCORDING TO WHICH ONE THING IS ORDERED TOWARDS ANOTHER SO THAT IT BE SAID THAT ONE IS HAD BY THE OTHER.

B. There are five chief modes of having, to wit:

a. First, BY INHERENCE, or the mode wherein an accident is had by a substance.

b. Second, BY CONTAINMENT, as a cistern has water.

c. Third, BY POSSESSION, as a man has a field.

d. Fourth, BY RELATION, as a father has a son.

e. Fifth, BY JUXTA-POSITION, as Italy has Switzerland on the north.

147. MOVEMENT: Regarding movement it is enough here to note that:

A. Movement is: THE STATE OF TENDENCY AND OF WAY WHEREBY SOME SUBJECT IS TRANSFERRED FROM ONE MODE OF HAVING ITSELF TO ANOTHER.

B. Movement can be considered in two ways, to wit, either materially for the form which is in become or movement, or formally for the very state of tendency and of way.

a. Under the former aspect it pertains reductively to the predicament of its term.

b. But under the latter aspect:
b1. it is a post-predicament,
b2. and cannot be reduced to any predicament,
b3. but rather as an analogue of itself ('per se') respects several predicaments, to wit:

b3a. substance	-	according as movement is corruption-generation;
b3b. quantity	-	according as movement is increase or decrease;
b3c. quality	-	according as movement is alteration;
b3d. where	-	according as movement is translocation.

C. However, the post-predicament 'movement' has itself otherwise in instantaneous movement (in movement towards substance), and in successive movement (in movement towards quantity, quality and where):

a. For movement towards a substance:
a1. is INSTANTANEOUS,
a2. and in it there is no real distinction:
a2a. between:
a2a1. movement or become (fieri),
a2a2. and its term or 'have become' (factum esse),
a2b. nor between these and the thing moved or the form according to which the movement is.
a3. And therefore it does not bespeak any special modality or nature, which would be:
a3a. distinct from all the ten predicaments,
a3b. and irreducible to any of them.
a4. And therefore this instantaneous movement,
a4a. like the other four post-predicaments (to wit, opposition, priority, togetherness and have),
a4b. retains real identity with some (one) of the ten predicaments.

b. But movement of translocation, of alteration and of increase and decrease:
b1. is SUCCESSIVE,
b2. and in it there is real distinction:
b2a. between:
b2a1. movement or become (fieri),
b2a2. and its term or 'have become' (factum esse),
b2b. and between these and the thing moved or the form according to which the movement is.
b3. And therefore it does bespeak a special modality or nature or entity, which is:
b3a. distinct from the entities bespoken by the ten predicaments,
b3b. and reducible to none of them.
b4. And therefore this successive movement is not reducible to the predicaments to which it is movement, because it signifies a new nature or modality, modificative of these predicaments.
b4a. Wherefore it does not have itself to these predicaments as their existence has itself to them:
b4b. for the existence of an essence pertaining to some predicament,
b4b1. although really distinct from the essence of the predicament,
b4b2. nevertheless does not add any real nature modificative of that essence,
b4b3. and therefore is reducible to the predicament whereto that essence pertains; so that:
b4b3a. the existence of a substance is reducible to the predicament of substance,
b4b3b. and the existence of a quality is reducible to the predicament of quality,
b4b3c. and so on for the rest.
b5. And therefore successive movement:
b5a. is a post-predicament in a quite special sense, inasmuch as,
b5b. unlike all the other post-predicaments (to wit, opposition, priority, togetherness and have),
b5c. it is really distinct from all the ten predicaments.

……

SUB-SECTION TWO.

……

ANALOGOUS PREDICABILITY.

……

148. ORDER OF PROCEDURE: Having dealt with univocal predicability, in which predicates respect inferiors (subjects) according to a same character or signification:

A. We come to the consideration of ANALOGY, or, in other words, of the characteristic of predicates which befit subjects according to a DIVERSE signification.

B. But a predicate which is attributed to many subjects according to a DIVERSE CHARACTER, might befit them according to a character:
a. either UTTERLY diverse,
b. or only PARTLY diverse: and in this latter case, then in either of two ways, to wit:
b1. either SIMPLY (simpliciter) diverse,
b2. or IN A SECONDARY FASHION (secundum quid) diverse.

C. Hence the following division of predicates according to same-ness and unsameness of signification or of character signified:-

A predicate attributed to many subjects may signify in them a character which is
- either the SAME in each subject.
- or DIVERSE in each subject: and then
  - either PARTLY diverse: and then again
    - either IN A SECONDARY FASHION diverse.
    - or SIMPLY diverse.
  - or UTTERLY diverse.

D. To which diversity analogous predicability pertains, is to be determined here-below.

E. And indeed:
a. The notion of ANALOGY:
a1. since:
a1a. it is of the greatest importance in the whole of philosophy,
a1b. and is to some degree difficult and controverted,
a2. needs some special attention.
b. Therefore we must determine that notion, by the pursuit of its definition, through comparison:
b1. with the univocal,
b2. and with non-univocals.
c. And indeed, here more will be said than is strictly necessary for our present purpose:
c1. because the theory of analogy is called into use in other parts of philosophy,
c2. and thus will be avoided the necessity of dwelling upon it at length again in other places.

F. Accordingly:
a. This treatment of analogous predicability will consider:
a1. First, the nature of analogue;
a2. Secondly, the division of analogues;

a3. Thirdly, a comparison between the Suarezian doctrine of analogy and that of St Thomas.

b. Hence the following order:-

On analogous predicability:	NATURE of analogue	Chapter nine.
	DIVISION of analogues	Chapter ten.
	Comparison of Suarez' doctrine and that of St Thomas	Chapter eleven.

……

CHAPTER NINE.

NATURE OF ANALOGUE.

149. NOMINAL DEFINITION OF ANALOGUE: It is manifest indeed that:

A. Not in the same way are these concepts predicable of their inferiors, to wit:

a. On the one hand, the concepts 'man', 'carpenter', 'horse';

b. And on the other hand, the concepts 'tick', 'lighter', 'board', 'match', 'angry', 'stupid', 'healthy', 'being'.

B. The former, to wit, 'man', 'carpenter' and 'horse', are predicable of subjects according to the SAME CHARACTER or signification, i.e. so as to signify in their subjects THE SAME CHARACTER.

a. Thus 'man' is said of Peter, of Paul and of John, so as to signify in each of them the same character, to wit, 'rational animal'.

b. Thus also 'carpenter', said of James, of Henry and of Thomas, signifies in each of them the same character, to wit, 'skilled in, and engaged in, fabricating houses and such like from wood.'

c. Thus again 'horse', said of Carbine, of Trafalgar, of Phar Lap and of Bernborough, retains always an unvaried signification.

C. But the latter concepts, to wit, 'tick', 'lighter', 'board', 'match', 'angry', 'stupid', 'healthy' and 'being' are predicated of diverse subjects ACCORDING TO VARIED SIGNIFICATION.

a. This is evident with regard to 'tick' from the following:-

'The cause of my dog's sickness	is a tick'.	where 'tick signifies a determinate parasitical animal.
'The cause of my awakening		where 'tick signifies a determinate slight, sharp, noise.

b. Similarly with regard to 'lighter', which as predicated:

b1. of one subject signifies 'that whereby a fire is enkindled', as when we predicate 'lighter' of a mechanism used for lighting cigarettes;

b2. of another subject signifies 'small ship used as a tender to larger ships'.

c. Likewise with regard to 'board', which as predicated:

c1. of one subject signifies 'wooden plank';

c2. of another subject signifies 'committee of men', as when we speak of a Board of Directors, or the Board of Trade, or the Education Board.

d. In similar manner with regard to 'match', which as predicated;
d1. of one subject signifies 'device for enkindling fires';
d2. of a second subject signifies 'equal', as when we say "Wellington was a match for Napoleon'.
d3. of a third subject signifies 'game in which there is contest for victory'.

e. Again with regard to 'angry', which when predicated;
e1. of one subject signifies 'affected by an animal passion inclining to harm a hurter', as when we say 'the dog is angry'.
e2. of another subject signifies 'producing disorder or damage', as when we say 'the sea is angry'.

f. Likewise with regard to 'stupid', which when predicated:
f1. of one subject signifies 'dullness of mind';
f2. of a second subject signifies 'subject of mental dullness', as if we say 'Henry is stupid'.
f3. of a third subject signifies 'effect of mental dullness', as if we say 'this plan is stupid'.

g. Similarly with regard to 'healthy', which when predicated:
g1. of one subject signifies 'essence of health', as when we say 'normally functioning organic constitution is healthy';
g2. of a second subject signifies 'subject of health', as when we say 'Peter is healthy'.
g3. of a third subject signifies 'cause of health', as when we say 'this food is healthy' or 'a sea-voyage is healthy';
g4. of a fourth subject signifies 'sign of health', as when we say 'rosy colour of the cheeks is healthy'.

h. In like manner with regard to 'being', which as predicated:
h1. of one subject, to wit, of God, signifies 'being from self' or 'essence which is be';
h2. of a second subject, to wit, of creatures, signifies 'being from other' or 'essence which has be';
h3. of a third subject, to wit, of substance, signifies 'being in self';
h4. of a fourth subject, to wit, of accident, signifies 'being in other'.

D. But among these names which are predicable according to DIVERSE character, there is distinction to be made:

a. For some of them in the diverse attributions made of them signify a character UTTERLY diverse:
a1. which is so in the first four examples, to wit, 'tick', 'lighter', 'board' and 'match'.
a2. Concepts which are thus predicable of many according to a character UTTERLY diverse are called PURELY EQUIVOCAL or SIMPLY EQUIVOCAL.
a3. But OBSERVE that 'utterly' diverse is not the same as 'totally' diverse:
a3a. For a name may in the diverse predications made of it:
a3a1. signify characters utterly diverse, as does 'tick' when predicated of that beast and of that sound;
a3a2. without signifying characters totally diverse: - inasmuch as within the comprehension of those diverse characters there is some same note.
a3b. For:
a3b1. Utter diversity is had whenever there is such diversity that there is no sameness according to some note;
a3b2. But total diversity, taking the term 'total' strictly as here, requires that there be no sameness according to any note at all.
a3c. Thus (in Latin) 'gallus' signifies 'rooster' and 'Gaul', between which characters:
a3c1. there is utter diversity for there is no sameness according to the essential notes of 'rational' and 'irrational',
a3c2. though there is not total diversity, for there is sameness according to the essential note of 'animal'.
a3d. And:
a3d1. utter diversity is enough to render a name purely equivocal,
a3d2. total diversity not being required for pure equivocity.

b. But some of those names in the diverse attributions made of them signify a character NOT UTTERLY diverse:

b1. which is so in the last four examples, to wit, 'angry', 'being', 'stupid' and 'healthy': for the characters signified by each of these in their various predications:

b1a. though they have some UNSAMENESS between them,

b1b. nevertheless retain SOME SAMENESS.

b2. Concepts which are thus predicable of many according to a character NOT UTTERLY diverse, but PARTLY DIVERSE AND PARTLY THE SAME, are called ANALOGOUS CONCEPTS or ANALOGUES.

150. ESSENTIAL DEFINITION OF ANALOGUE: However, so far we have not yet an ESSENTIAL definition of analogue.

A. Wherefore:

a. since analogue participates to some extent in the univocal and to some extent in the equivocal,

b. we must further find out:

b1. Whether analogue approaches NEARER to the one or the other (i.e. to the univocal or to the equivocal),

b2. or whether it is EQUALLY distant from each of them?

B. And indeed:

a. That:

a1. 'angry' or 'stupid' or 'healthy' or 'being':

a1a. neither approaches NEARER TO THE UNIVOCAL,

a1b. nor is EQUALLY DISTANT from both univocal and equivocal,

a2. is clear:

b. For 'angry' as said of an animal ESSENTIALLY differs from 'angry' as said of the sea:

b1. For as said of an animal signifies 'affected by animal passion inclining to harm a hurter';

b2. whereas as said of the sea, it signifies 'productive of effects similar to the effects of anger'.

c. Similarly 'stupid' as said of mental dullness, and of Henry, and of a plan, ESSENTIALLY DIFFERS in the three cases:

c1. For as said of mental dullness it signifies 'that which is stupidity' or 'essence of stupidity';

c2. whereas as said of Henry it signifies 'that which has stupidity' or 'subject of stupidity';

c3. and whereas as said of a plan it signifies 'that which is caused by stupidity' or 'effect of stupidity'.

d. Likewise 'healthy' as said of normally functioning organic constitution, and of Peter, and of food, and of colour, ESSENTIALLY differs in the four cases:

d1. For as said of normally functioning organic constitution it signifies 'that which is health' or 'essence of health';

d2. whereas as said of Peter it signifies 'that which has health' or 'subject of health';

d3. and whereas as said of food it signifies 'that which causes health';

d4. and whereas as said of colour it signifies 'that which signifies health'.

e. In similar fashion 'being' as said of God and of creatures, of substance and of accident, ESSENTIALLY differs:

e1. For:

e1a. as said of God it signifies 'being from self',

e1b. whereas as said of creature it signifies 'being from other';

e2. and:

e2a. as said of substance it signifies 'being in self',

e2b. whereas as said of accident it signifies 'being in other'.

f. Therefore:

f1. These analogues CANNOT be said of their inferiors, without contradiction, according to a character ESSENTIALLY THE SAME: for they are said of them according to characters ESSENTIALLY UNSAME.

f2. And therefore the analogue in its various attributions is predicated according to characters MORE UNSAME THAN SAME: for these characters:

f2a. are ESSENTIALLY unsame,

f2b. and hence can be only ACCIDENTALLY or SECONDARILY same.

f3. Wherefore the analogue:

f3a. neither EQUALLY participates from univocal and equivocal,

f3b. nor approaches NEARER TO UNIVOCAL than to equivocal.

C. Therefore it must be held that the ANALOGUE approaches NEARER TO EQUIVOCAL, inasmuch as IT IS PREDICABLE OF ITS INFERIORS ACCORDING TO A CHARACTER ESSENTIALLY DIVERSE.

D. But:

a. since an alalogue:

a1. is not purely equivocal (i.e. is not predicable according to a character UTTERLY diverse),

a2. but rather is predicable according to a character NOT UTTERLY diverse,

b. an ANALOGUE must be said to be a PREDICATE WHICH BEFITS MANY ACCORDING TO A CHARACTER SIMPLY SPEAKING OR ESSENTIALLY DIVERSE, YET IN A SECONDARY FASHION OR ACCIDENTALLY THE SAME.

c. And:

a1. on this account the analogue is often called also EQUIVOCAL FROM DESIGN (aequivocum a consilio) or EQUIVOCAL IN A QUALIFIED SENSE (aequivocum secundum quid), inasmuch as it is BASED upon an accidental similitude.

a2. On the other hand, a predicate which WITHOUT FOUNDATION signifies diverse characters is called EQUIVOCAL FROM CHANCE (aequivocum a casu) or EQUIVOCAL SIMPLY (aequivocum simpliciter).

151. SUMMARY: What has been said is summarized in the following scheme, in which the logical division appears more clearly:-

Any PREDICATE which is said of many is said of them ACCORDING TO A CHARACTER (REASON, MEANING)

- either the SAME: and then the predicate is UNIVOCAL.
- Or DIVERSE: and then the predicate is a HOMONYM: and then the character may be diverse
  - either NOT UTTERLY, but partly the same and partly diverse:
    - yet not equally same and diverse, to wit,
      - not indeed
        - together
          - simply the same,
          - and simply diverse.
        - For this notion would be contradictory
      - nor
        - together
          - in a secondary fashion the same,
          - and in a secondary fashion diverse;
        - For this notion would not save equality, since the character simply considered preponderates either towards sameness or towards diversity.
    - but unequally same and diverse:
      - not however
        - in such wise that it more participates univocity;
        - For if that were so, then univocals too would be analogues: since univocals are
          - simply (essentially) the same,
          - and in a secondary fashion (individually) diverse.
      - but
        - more participating equivocity
        - so that the predicate is predicated according to a character
          - SIMPLY DIVERSE,
          - but IN A SECONDARY FASHION THE SAME.
        - And then the predicate is an ANALOGUE.
  - or UTTERLY: and then the predicate is EQUIVOCAL.

……

CHAPTER TEN.

DIVISION OF ANALOGUES.

152. ANALOGY OF ATTRIBUTION OR OF PROPORTION: Let us take the example 'healthy':

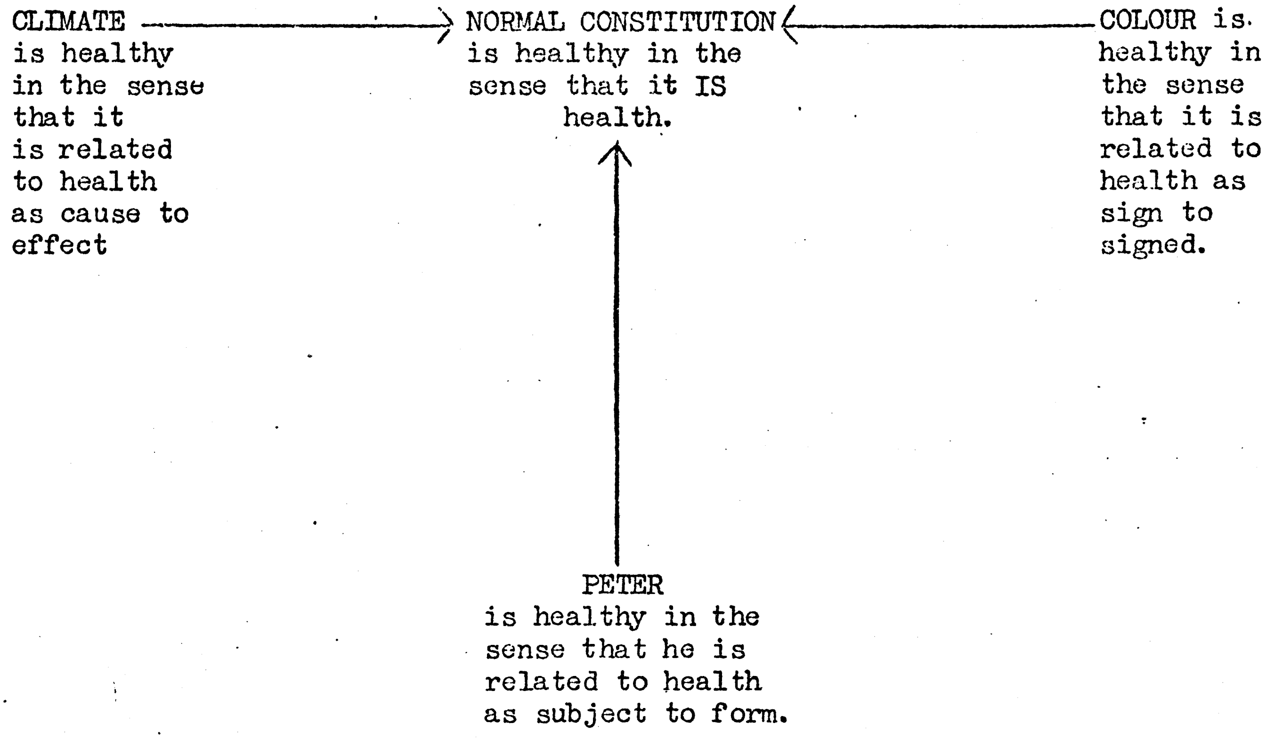
A. 'Healthy':
a. is predicable:
a1. of:
a1a. health or normal organic constitution,
a1b. food,
a1c. colour or complexion,
a1d. Peter;
a2. because it signifies:
a2a. the ESSENCE of health or of normal organic constitution,
a2b. the EFFICIENT CAUSE of health,
a2c. the SIGN of health,
a2d. or the SUBJECT of health.
b. Which is thus illustrated schematically:-

'Normal state of organic constitution	....	as ESSENCE of health.
'A climate............................	.... is healthy'	as CAUSE of health.
'A colour.............................	....	as SIGN of health.
'Peter................................	....	as SUBJECT of health.

B. Wherefrom it is apparent:
a. that:
a1. not only is the character signified by the name 'healthy' SIMPLY (essentially) diverse;
a2. but:
a2a. normal organic constitution alone IS health (is the essence of health); or, in other words, to this analogate alone is health INTRINSIC,
a2b. whereas to the other analogates health has itself EXTRINSICALLY:
a2b1. for climate (or cause of health) and health are outside each other;
a2b2. and colour (or sign of health) and health are outside each other;
a2b3. and Peter (or subject of health) and health are outside each other.

C. This analogy:
a. in which a character simply diverse:
a1. is INTRINSIC TO ONE inferior or analogate only,
a2. and has itself EXTRINSICALLY to the other inferiors or analogates,
b. is called ANALOGY OF ATTRIBUTION OR OF PROPORTION.
b1. But:
b1a. the analogate:
b1a1. to which the character signified is INTRINSIC,
b1a2. and relatively to which the analogous predicate befits the other analogates,
b1b. is called the PRINCIPAL ANALOGATE.
b2. Whereas:
b2a. those analogates:
b2a1. to which the character signified is EXTRINSIC only,
b2a2. and which are referred or related to the principal analogate,
b2b. are called SECONDARY ANALOGATES.

D. Which may be thus schematically illustrated:-



CLIMATE is healthy in the sense that it is related to health as cause to effect

NORMAL CONSTITUTION is healthy in the sense that it IS health.

COLOUR is healthy in the sense that it is related to health as sign to signed.

PETER is healthy in the sense that he is related to health as subject to form.

153. ANALOGY OF PROPORTIONALITY: But not all analogues are susceptible of being explained in the above fashion.

A. Let us take these analogues:
a. 'being',
b. 'knowledge',
c. 'angry',
d. 'shepherd'.

B. For:

a. 'Being' as said of God and of a creature, of substance and of accident, requires another explanation;

b. And likewise 'knowledge' as said of understanding (intellection) and of sensation;

c. And similarly 'angry' as said of an animal, or God, and of the sea;

d. And also 'shepherd' as said of a watcher of sheep and of a superior of a community (v.g. a bishop).

C. Which will be apparent if among the following schemes, the last four are compared with the first:

a. The title or reason which

organic constitution
has to be named healthy............IS..........that it IS health.

climate
has to be named healthy............is not.....that it is health.

colour
has to be named healthy............is not.....that it is health.

Peter
has to be named healthy............is not.....that he is health.

b. The title or reason which

God
has to be named being..............IS..........that he IS a being.

creature
has to be named being..............IS..........that it IS a being.

substance
has to be named being..............IS..........that it IS a being.

accident
has to be named being..............IS..........that it IS a being.

c. The title or reason which

intellection
has to be named knowledge..........IS..........that it IS knowledge.

sensation
has to be named knowledge..........IS..........that it IS knowledge.

d. The title or reason which

passion of an animal
has to be named anger..............IS..........that it IS anger.

God's will to punish
has to be named anger..............IS..........that it IS (improperly) anger.

the storminess of the sea
has to be named anger..............IS..........that it IS (improperly) anger.

e. The title or reason which

a watcher of sheep
has to be named shepherd...........IS..........that he IS a shepherd.

a bishop
has to be named shepherd...........IS..........that he IS (improperly) a shepherd.

D. In these last four examples:
a. the simply diverse character:
a1. INTRINSICALLY befits ALL the analogates,
a2. whereof it represents the SIMPLY DIVERSE ESSENCES.
b. For:
b1. God, creature, substance and accident:
b1a. are essentially and INTRINSICALLY being,
b1b. but diversely.
b2. Likewise understanding and sensation:
b2a. are essentially and INTRINSICALLY knowledge,
b2b. but diversely.
b3. Similarly the passion of the animal, the will of God to punish, and the storminess of the sea:
b3a. are essentially and INTRINSICALLY anger,
b3b. but diversely.

b4. And also a *watcher of sheep* and a *bishop:*
b4a. are essentially and *INTRINSICALLY* shepherds,
b4b. but *diversely*.

E. Yet this diversity:
a. retains between the analogates some *PROPORTIONALITY*,
b. and therefore this analogy is called *ANALOGY OF PROPORTIONALITY*.
b1. For *proportionality* is *PROPORTION OF PROPORTIONS*,
b2. as is illustrated thus:-

$$\text{(proportion)}\ \frac{3}{6}\qquad \underset{\text{(proportionality)}}{=}\qquad \frac{4}{8}\ \text{(proportion)}$$

b3. or thus:

$$\underset{\text{(proportion)}}{3 \quad : \quad 6} \qquad \underset{\text{(proportionality)}}{::} \qquad \underset{\text{(proportion)}}{4 \quad : \quad 8}$$

b4. Which is to be understood thus: 'As 3 has itself to 6, so 4 has itself to 8'.

F. And in like manner:

a. $$\frac{\text{Essence of God}}{\text{be of God}} \approx \frac{\text{Essence of creature}}{\text{be of creature}}$$

b. $$\frac{\text{Essence of substance}}{\text{be of substance}} \approx \frac{\text{Essence of accident}}{\text{be of accident}}$$

c. $$\frac{\text{Intellection}}{\text{form had intellectively}} \approx \frac{\text{Sensation}}{\text{form had sensitively}}$$

d. $$\frac{\text{Animal anger}}{\text{effects of anger}} \approx \frac{\text{God's punitive will}}{\text{punishment}} \approx \frac{\text{Storminess of sea}}{\text{its effects}}$$

e. $$\frac{\text{Shepherd}}{\text{direction of flock}} \approx \frac{\text{Superior}}{\text{direction of community}}$$

G. But now it is to be explained why in these diagrams the *proportionality* has been indicated by the sign ' $\approx$ ', whereas when it was question of *mathematical* proportionality above the sign '$=$' was used.

a. The *REASON* is that:
a1. whereas when it is question of *mathematical* proportionality the proportions are *SIMPLY* the same, - wherefore when 3 is named half of 6, and when 4 is named half of 8, the name '*half*' is *UNIVOCAL*;
a2. when it is question of *analogical* proportionality the proportions are only *SECONDARILY* (secundum quid) the same, but *simply* diverse, - wherefore when God is named being and when a creature is named being, the name '*being*' is *ANALOGOUS*.

b. Hence it is not sufficient for analogy of proportionality that diverse inferiors receive the same predicate on account of sameness of proportions, but it is required also that this sameness of proportions (i.e. the proportionality) be a sameness ONLY SECONDARILY: which may be thus illustrated in the following four schemes, where ONLY THE LAST verifies proportionality:-

b1 'HALF' signifies

QUANTITY	WITH	PROPORTION TO	DOUBLE	
3	by reason of	proportion to	6	is half UNIVOCALLY.
		‖		
4	by reason of	proportion to	8	

b2 'SON' signifies

MALE ANIMAL	WITH	RELATION TO	PARENT	
George VI	by reason of	relation to	George V	is a son UNIVOCALLY.
		‖		
Young bull	by reason of	relation to	his sire	
		‖		
Young horse	by reason of	relation to	his sire	

b3 'WALKER' signifies

ANIMAL	WITH	PROPORTION TO	WALK	
Man	by reason of	proportion to	walk	is a walker UNIVOCALLY.
		‖		
Horse	by reason of	proportion to	walk	
		‖		
Cow	by reason of	proportion to	walk	
		‖		
Dog	by reason of	proportion to	walk	

b4. 'BEING' signifies

ESSENCE	WITH	PROPORTION TO	BE	
God	by reason of	proportion to	his be	is a being ANALOGICALLY.
		≀≀		
Creature	by reason of	proportion to	its be	
		≀≀		
Substance	by reason of	proportion to	its be	
		≀≀		
Accident	by reason of	proportion to	its be	

H. But analogy OF PROPORTIONALITY is divided into analogy of PROPER proportionality and analogy of METAPHORIC proportionality:

a. If indeed the proportionality is proper, that is, if the character signified by the analogue is found formally in each proportion:

a1. then is had ANALOGY OF PROPER PROPORTIONALITY.

a2. Such is the analogy of being: for the character bespoken by the analogue, which character is 'proportion of essence to be', is found formally in each of the proportions, to wit:

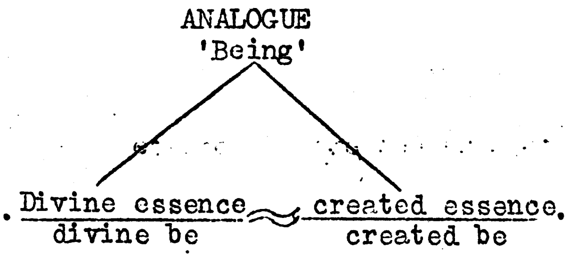
a2a. For the character bespoken by the analogue, which character is 'proportion of essence to be', is found formally in each of the proportion to wit:

a2a. in the proportion of the divine essence to the divine be,
a2b. in the proportion of the creature's essence to the creature's be,
a2c. in the proportion of the essence of substance to the be of substance.
a2d. and in the proportion of the essence of accident to the be of accident.

b. But if the proportionality is improper:
b1. that is, if the character signified by the analogue is found:
b1a. formally indeed in one of the proportions,
b1b. but ONLY VIRTUALLY in the other (or others),
b2. then is had ANALOGY OF METAPHORIC PROPORTIONALITY.
b3. Such is the analogy of angry:
b3a. For the character bespoken by the analogue, which character is 'proportion of passion towards the harm of a hurter', is found:
b3a1. formally indeed in one of the proportions,
b3a2. but ONLY VIRTUALLY in the proportion of the storminess of the sea towards the wrecking of ships, inasmuch as this proportion of the sea to the wrecking of ships is a POWER (virtue) of producing the same effects as anger produces.

c. Which may be thus schematically illustrated through the comparison of these two schematic representations:-

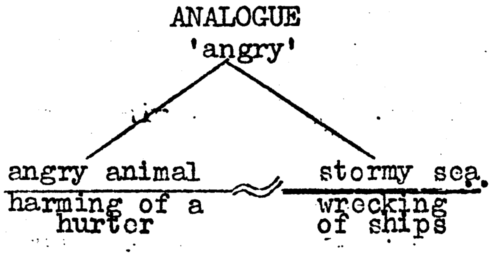
c1.



In this proportion..... the character signified by 'being' is found formally.

....Also in this proportion the character signified by 'being' is found formally.

c2.



In this proportion..... the character signified by 'angry' is found formally.

....But in this proportion the character signified by 'angry' is found only virtually.

d. It may be noted that St Thomas:
d1. indicates this distinction in these places: De Malo, q.7,a.1; De Verit. q.2, a.11;
d2. and speaks of diverse proportions in these places: In II Sent. dist. 27, q.1, a.3; In I Post. Anal. lect.12, n.8; In V Ethic. lect.5, 6, 7; In V Polit. lect.1; II-II, q.61, aa. 1-2; q.63, a.1.

154. EXAMPLES OF DIVERSE ANALOGIES: Examples of the diverse analogies are found in the following, the schematic division being taken substantially from the work of Father Ramirez O.P.: 'De Analogia Nominum secundum Doctrinam Aristotelico-Thomisticam' (p.58):-

A. SCHEMATIC DIVISION OF ANALOGY: This is as follows:

Analogy is divided according as a character simply diverse is

- either INTRINSICALLY NOT IN ALL the analogates, but in one only: ANALOGY OF ATTRIBUTION: it may be
  - either from one: and then
    - either according to efficient cause: and then
      - either of one from one...1
      - or of many from one......2
    - or according to material cause widely taken i.e. subject): and then
      - either of one from or in one...................3
      - or of many from or in one......................4
  - or to one: and then
    - either according to final cause: and then
      - either of one to one..................5
      - or of many to one....6
    - or according to exemplary (i.e. extrinsic formal) cause: and then
      - either of one to one.............7
      - or of many to one..8
- or INTRINSICALLY IN ALL the analogates: analogy according to intrinsic formal cause or ANALOGY OF PROPORTIONALITY: but the character may be
  - either FORMALLY in each proportion: ANALOGY OF PROPER PROPORTIONALITY: but the diversity between these proportions may be
    - either determinate (or finite)..............9
    - or indeterminate (or infinite)...........10
  - or FORMALLY NOT IN EACH proportion, but formally in one and virtually in the other: ANALOGY OF METAPHORIC PROPORTIONALITY: but the diversity between these proportions may be
    - either determinate (or finite)............11
    - or indeterminate (or infinite)...........12

B. EXAMPLES: The ultimate members of the above division are, for the sake of easy reference, numbered: the following as correspondingly numbered refer respectively to those ultimate members:-

a. Analogy of attribution according to efficient cause:-

Foresight
A book...
is prudent...............................1

A book...........
An action.........
A mode of speech..
A kind of teaching
is prudent...................2

'Prudent' is analogous.

b. Analogy of attribution according to material cause (subject):-

Man........
An intellect
is human...............................3

An intellect...........
A sight or hearing......
A colour................
A stature...............
A corporeal organization
is human..................4

'Human' is analogous.

c. Analogy of attribution according to final cause:-

Normal organic constitution
A climate.................
is healthy..............5

A climate...
A medicine..
A complexion
Sleep.......
is healthy............................6

'Healthy' is analogous.

d. Analogy of attribution according to exemplary cause:-

A structure
A picture..
is a bridge.................................7

A painter's idea.....
An original picture...
A copy of that picture
is a bridge..................8

'Bridge' is analogous

e. Analogy of proper proportionality with determinate diversity of proportions:-

Substance (v.g. lead)
Accident (v.g. shape)
is a being.....................9: 'Being' is analogous.

f. Analogy of proper proportionality with indeterminate diversity of proportions: of this three examples are given:

f1. Analogy of being between God and creatures:-

God......
A creature
is a being...............................10: 'Being' is analogous.

f2. Analogy of knowledge:-

Understanding Sensation....	is knowledge.....................	10: 'Knowledge' is analogous.

f3. Analogy of love:-

Intellective affect Sensitive affection	is love....................	10: 'Love' is analogous.

g. Analogy of metaphoric proportionality with determinate diversity of proportions: of this three examples are given:-

g1. Analogy of 'sow and pigs':

A female pig with young.. A large rock with smaller rocks surrounding it..... A large channel feeding smaller channels.......	are 'sow and pigs'............	11: 'Sow and pigs' is analogous.

g2. Analogy of feeding:-

Giving food to an animal Pouring water into a channel...............	is feeding it.........	11: 'Feeding' is analogous.

g3. Analogy of 'male and female':-

Animals....... Socket fittings	are male and female.............	11: 'Male and female' is analogous.

h. Analogy of metaphoric proportionality with indeterminate diversity of proportions: of this four examples are given:-

h1. Analogy of family:-

Parents and children.... Parents and litter...... A number of co-ordinated streams................	are a family..........	12: 'Family' is analogous.

h2. Analogy of anger:-

An animal God...... The sea..	is angry...........................	12: 'Angry' is analogous.

h3. Analogy of threshold:-

Doorstep of a house........ Initial concept of a science	is a threshold...	12: 'Threshold' is analogous.

h4. Analogy of bride-groom:-

A married man......
Christ (relatively to the Church)....
Yahweh (relatively to Israel).......
is a bride-groom....................12: 'Bride-groom' is analogous.

155. ATTRIBUTION BY PRIORITY AND POSTERIORITY: As said above (n.152), in analogy of attribution or proportion, the character signified by the analogue is intrinsic to the PRINCIPAL analogate, but befits the SECONDARY analogates only through reference to the principal.

A. For this reason the signified character is said to be:
a. in analogy of attribution or of proportion, predicated:
a1. by priority (per prius) of the principal analogate,
a2. and by posteriority (per posterius) of the secondary analogates.
b. Hence the QUESTION arises: Whether this manner of predicating:
b1. pertains to every analogue (whether the analogue be of attribution or of proportionality),
b2. or pertains to the analogue of attribution only?

B. Authors are not agreed upon this point: among Thomists opinions are as follows:

a. The affirmative opinion:
a1. is held by:
a1a. Blanche (Sur le sens de quelques locutions concernant l'analogie dans la langue de S.Thomas: Revue des Sc. Phil. et Theol., janvier 1921; La notion d'analogie dans la philosophie de S.Thomas: ibid., avril 1921; L'analogie: Rev. de Phil., mai-juin 1923; Une theorie de l'analogie: Rev. de Phil., janvier-fevr. 1932).
a1b. who in this follows Ferrariensis.
a2. According to this opinion:
a2a. this distinction in manner of predicating belongs to every analogue,
a2b. so that every analogue is defined relatively to some one, of which it is predicated by priority.

b. But the contradictory opinion:
b1. is held by:
b1a. Ramirez (De Analogia secundum doctrinam Aristotelico-Thomisticam, p.75);
b1b. Le Rohellec (Problemes Philosophiques, pp.114ss);
b1c. Penido (Le Role de l'analogie en theologie dogmatique; Revue Thomiste, nov.1934, fevr.1935);
b1d. Maritain (Les Degres du Savoir);
b1e. Maquart (Elementa Philosophiae, I, pp.101-102);
b1f. all of whom follow Cajetan.
b2. These authors:
b2a. admit indeed that every analogue is UNEQUALLY predicated of the analogates,
b2b. But they deny that this unequal predication is necessarily made relatively to some one;
b2b1. to one indeed, when it is an analogue according to attribution;
b2b2. but to several diverse when it is an analogue according to proportionality.
b3. Thus that analogue ALONE which is according to ATTRIBUTION ought to be defined in terms of PRIORITY AND POSTERIORITY (per prius et posterius).

C. This latter opinion is shown by the following considerations to be alone admissible:

a. For it is impossible that an analogue which is predicated INTRINSICALLY of all the analogates, be said of them RELATIVELY TO SOME ONE, unless they agree in one UNIVOCAL formal character, unequally participated.

a1. This analogy of inequality, as Cajetan rightly calls it, merits the name of univocity rather than of analogy.
a2. Thus:
a2a. animality is:
a2a1. UNEQUALLY,
a2a2. although univocally,
a2b. predicated of man and of amoeba.

b. But an analogue according to proportionality:
b1. consists in some formal character:
b1a. not univocal,
b1b. but only PROPORTIONALLY ONE,
b2. UNEQUALLY participated by the diverse analogates,
b3. and thus it consists "in this:
b3a. "that there is a same PROPORTION of two to DIVERSE things,
b3b. "as:
b3b1. "wavelessness to the sea,
b3b2. "and windlessness to the air." (In V Metaphys. lect.8, ed. Cathala, n.879).

D. For the understanding of the more difficult texts of St Thomas, IT IS TO BE NOTED that St Thomas sometimes speaks of analogy IN THE ABSTRACT (in actu signato), and sometimes speaks of analogy IN THE CONCRETE (in actu exercito).

a. When he speaks of analogy in the abstract, he always expressly distinguishes the diverse manner of predicating:
a1. of analogues of attribution,
a2. and of analogues of proportionality.

b. On the other hand, when he speaks in the concrete, in many places throughout his works he adduces examples in which it is question of analogates:
b1. which intrinsically have a character:
b1a. proportionally one in all,
b1b. YET ORDERED RELATIVELY TO SOME FIRST;
b2. because, in these cases, the two analogies (to wit, of attribution, and of proportionality) are found mixed.

c. The following (In I Ethic. lect.7, in fine) is one text AMONG MANY OTHERS, where this twofold manner of considering analogy is found:

c1. "One name is said" (he is speaking in the abstract!) "of many according to characters diverse not totally, but agreeing in some one: (he is speaking of analogy! which is twofold):
c1a. "Sometimes indeed in this that they are referred TO ONE principle ....but sometimes in this that they are referred TO ONE end.......... sometimes according to diverse proportions TO THE SAME subject." (He is speaking of analogy OF ATTRIBUTION OR OF PROPORTION, which is said through reference TO ONE!).
c1b. "Or according to one proportion TO DIVERSE subjects; for sight towards the body and intellect towards the soul have the same proportion. Wherefore, just as sight is a power of a corporal organ, so also intellect is a power of the soul without participation of the body." (He is speaking of ANALOGY OF PROPORTIONALITY, which is not through reference to one, but TO DIVERSE things!).

c2. "Thus therefore" (he is speaking in the concrete!) (Aristotle) "says that good is said of many, not according to characters utterly different........but more according to analogy, that is, same proportion:
c2a. "Inasmuch as all goods depend upon ONE first principle of goodness, or inasmuch as they are ordered to ONE end........" (i.e. ACCORDING TO ANALOGY OF ATTRIBUTION!).
c2b. "Or also all goods are said to be good more according to analogy, that is, same proportion, as sight is a good of the body and intellect is a good of the soul (i.e. ACCORDING TO ANALOGY OF PROPORTIONALITY!).

c3. "THEREFORE:

c3a. "he prefers this third manner, because it is taken according to goodness INHERENT" (i.e. intrinsic!) "to things" (or ACCORDING TO ANALOGY OF PROPORTIONALITY!).

c3b. "But the first two manners, according to a SEPARATED" (i.e. extrinsic!) goodness, from which not so properly is something denominated" (or according to analogy of extrinsic proportion or of attribution!)

d. NOR IS IT ENOUGH TO SAY:

d1. with Blanche:

d1a. That in analogy OF PROPORTIONALITY:

d1a1. predication is made - by priority - of a principal analogate,

d1a2. while on the contrary it is made only by participation - therefore by posteriority - of the other analogates.

d1b. Therefore in both analogies:

d1b1. the character signified by the name is in the diverse analogates by priority and posteriority,

d1b2. without the two analogies being rendered univocal; for the priority and posteriority (in one analogy it is intrinsic, in the other analogy extrinsic) are SIMPLY diverse in the two analogies.

d2. For we may answer this by asking:

d2a. From which source in the case of analogy of proportionality comes this priority and posteriority?

d2b. Which question must be answered thus:

d2b1. Not from the very analogy of proportionality itself,

d2b2. but from an analogy of attribution annexed to it in the concrete "accidentally and obliquely" (per accidens et in obliquo), as Ramirez well says. (Op. cit. p.81, n.2).

156. DIVISION OF PREDICATE ACCORDING TO UNITY OF SIGNIFICATION: Accordingly predicates are divided on the score of the unity of their signification as predicated of many subjects, as shown in the following schematic illustration:-

- Predicate is
  - either UNIVOCAL: and then
    - either EVEN UNTO EQUALITY: as when man is said of Peter and Paul.
    - or WITH INEQUALITY: (and then is had "analogy of inequality"); as when animal is said of man and amoeba.
  - or a HOMONYM: and then
    - either an ANALOGUE: and then
      - either according to ATTRIBUTION or EXTRINSIC PROPORTION: as when healthy is said of normal organic constitution and of climate.
      - or according to PROPORTIONALITY: and then
        - either according to PROPER PROPORTIONALITY: as when being is said of God and a creature.
        - or according to METAPHORIC PROPORTIONALITY: as when angry is said of an animal and the sea.
    - or SIMPLY EQUIVOCAL: as when tick is said of a certain animal and a certain sound.

……

CHAPTER ELEVEN.

SUAREZIAN CONCEPTION OF ANALOGUE COMPARED WITH THAT OF ST THOMAS.

157. SUAREZIAN NOTION OF ANALOGUE: Whereas according to ST THOMAS, analogues are those concepts whereof the character signified is SIMPLY DIVERSE and secondarily (secundum quid) the same:

A. According to SUAREZIAN doctrine analogues ought to be defined as those whereof the signified character is SECONDARILY DIVERSE and simply the same.

a. This opposition between Suarez and St Thomas is thus exhibited:-

The character signified by an analogue:
- according to ST THOMAS, is
  - SIMPLY DIVERSE,
  - but SECONDARILY THE SAME.
- according to SUAREZ, is
  - SECONDARILY DIVERSE,
  - SIMPLY THE SAME.

b. This notion, if not in express terms, at least in substance, is found in Suarez;

b1. as Descoqs, a leading Suarezian, acknowledges in his work: 'Institutiones Metaphysicae Generalis' (t.I, p.210), where he writes:

b2. "It is to be admitted that Garrigou-Lagrange spoke not without foundation when he thus interprets the mind of the disciples of Suarez as regards analogy."

B. The foundation of the doctrine of St THOMAS is his moderate realism:

a. according to which the metaphysical universal is the VERY REAL NATURE ITSELF;

b. wherefrom it follows that the objective concept which represents that universal is the very THING known ('objective concept THING', as Descoqs puts it: op.cit. p.240).

C. But:

a. The foundation of the doctrine of SUAREZ is his conceptualism:

a1. according to which:

a1a. the metaphysical universal:

a1a1. IS NOT THE VERY REAL NATURE ITSELF,

a1a2. but an INTENTIONAL REPRESENTATION OF THE NATURE,

a1b. or an objective concept which signifies:

a1b1. NOT THE VERY THING known,

a1b2. but only a REPRESENTATION OF THE THING ('objective concept CONCEPT', as Descoqs puts it: op.cit. p.240).

b. Wherefore:

b1. on account of the distinction of the objective concept and the thing known,

b2. Suarez can avoid univocity: for, as Descoqs says:

b2a. "This being supposed,

b2a1. "it is clear that the unity of analogy............is ALREADY NOT IN THING, for those things are simply diverse,

b2b. "wherefore it cannot be attributed save to the concept, insofar as it is compared to the things themselves and represents them." (Op.cit. pp.143-144).

158. SUAREZIAN DIVISION OF ANALOGY: Whereas for ST THOMAS analogy of ATTRIBUTION is always extrinsic:

A. This analogy for SUAREZ is sometimes extrinsic, sometimes intrinsic:

a. Extrinsic analogy of attribution, for Suarez, is metaphoric: "The name is attributed to the secondary analogate only improperly as by metaphor", (Disput. Metaphys. t.26, p.17, n.14).

a1. This logically follows from his notion of analogy (whereof the character signified is SIMPLY the same),

a2. for, as Suarez says, in this extrinsic analogy "there is not had one concept common to all the analogates because the form wherefrom it is taken:

a2a. "is intrinsically and properly in one only,

a2b. "in the others tropologically" (i.e. figuratively) "and by extrinsic denomination." (Ibid).

b. But:

b1. INTRINSIC analogy of attribution is "MOST PROPER" (ibid.).

b1a. For "there is had a formally common and objective concept because the analogates are properly and intrinsically such, and truly agree in such a character, which the mind can abstractly or precisively conceive by one concept common to all." (Ibid. n.15).

b1b. This analogy corresponds to the analogy of proper proportionality of St Thomas.

b2. But:

b2a. It is not expressed, as in St THOMAS, under the form of some proportionality, because, since it is a concept SIMPLY ONE,

b2a1. proportionality disappears - for proportionality requires FOUR terms SIMPLY DIVERSE - ,

b2a2. and there remains only an unequal attribution:

b2a2a. by priority of the first analogate,

b2a2b, and by posteriority of the others.

b2b. Thus:

b2b1. the notion, simply one, is said by priority of God and by posteriority of creatures.

b2b2. However:

b2b2a. in the doctrine of ST THOMAS,

b2b2a1. since being is simply DIVERSE,

b2b2a2. we must say: "As being is to God, so being is to creatures" in similar fashion as we would say: "As two is to four, so three is to six": which may be thus shown schematically:-

$\frac{\text{Being}}{\text{God}} \approx \frac{\text{being}}{\text{creature}}$ is to be said as we say $\frac{2}{4} = \frac{3}{6}$.

b2b2b. But if being is simply ONE:

b2b2b1. then we cannot say: "As being is to God, so being is to creatures", thus:-

$$\frac{\text{Being}}{\text{God}} \approx \frac{\text{being}}{\text{creature}}$$

b2b2b2. for this would be the same as to say: "As two is to four, so two is to six", thus:-

$$\frac{2}{4} = \frac{2}{6}$$

B. This notwithstanding, SUAREZ admits an analogy of proportionality, WHICH HOWEVER IS METAPHORICAL.

a. For this analogy cannot be found in those analogues wherein a character SIMPLY THE SAME is formally intrinsic to all the analogates: for of every proportionality, as said just above, all the terms must be simply diverse.

b. Nor can it be found in those whose intrinsic character is virtually in one and formally in another: because in this case the character is not simply one.

c. Therefore this analogy of proportionality is not verified save extrinsically and CONSEQUENTLY BY METAPHOR:
c1. For which reason Suarez writes: "Every true analogy of proportionality includes something of metaphor and of properness." (Op. cit. t.26, p.16, n.11).
c2. For:
c2a. by reason of metaphor, a character:
c2a1. on other scores simply diverse, and therefore not really analogous,
c2a2. retains metaphoric unity necessary to save Suarezian analogy,
c2b. notwithstanding which it has the four terms really simply diverse necessary to establish proportionality.

159. OPPOSED DIVISIONS ILLUSTRATED: The opposition of the two divisions of analogy is illustrated thus:-

IN ST THOMAS

Analogy is divided into analogy
- of attribution (extrinsic)
- of proportionality
  - proper
  - metaphoric

IN SUAREZ

- of attribution
  - extrinsic
  - intrinsic
- of proportionality (metaphoric)

……………………………………………………

SECTION FOUR.

……………

THE SIGN OF THE UNIVERSAL, OR DEFINITION.

……………

160. ORDER OF PROCEDURE: This treatment of definition:

A. since definition is:
a. a locution or discourse or speech, and indeed a locution or discourse or speech,
b. which is a "mode of knowing",
c. and indeed that mode of knowing which is the sign of the universal,
d. and whereof the principal instrument is division:

B. therefore will deal:
a. First, with locution or discourse or speech,
b. Secondly, with the "modes of knowing";
c. Thirdly, with definition itself;
d. Fourthly, with its principal instrument, namely, division.

C. Hence the following order:-

On definition
- Pre-ambles
  - On speech or locution or discourse...Chapter twelve.
  - On the "modes of knowing"...........Chapter thirteen.
- On definition itself...........................Chapter fourteen.
- On its principal instrument, viz. division......Chapter fifteen.

CHAPTER TWELVE.

SPEECH, LOCUTION OR DISCOURSE.

161. NATURE OF SPEECH OR LOCUTION OR DISCOURSE (ORATIO): If this be said: "Man is an animal":

A. Then there is had:

a. Voice-sound conventionally significative: as has been explained above (nn.61-64).
al. And indeed in this, the example given does not differ from a term, such as a noun or a verb, (n.66), but "agrees with noun and verb" (In Periherm. I, lect.2, n.2)..
a2. Yet there is, in the example given something "wherein..............it differs from noun and verb" (ibid.).

b. Whereof the parts, if separated, signify something: thus the part 'man', if taken out from that whole, signifies something; and similarly the part 'animal'; and similarly the part 'is'.
bl. And here we have "that wherein discourse differs from noun and verb." (Ibid.).
b2. For, as explained above (n.66), of a noun or of a verb "no part, if separated, signifies".

c. But the parts indeed, if separated, signify something as a diction, not as an affirmation or negation:
cl. As a diction indeed, that is, as a term; for the parts of that whole are terms, to wit:
cla. nouns,
clb. and verb.
c2. But not as affirmation or negation: for no part of that whole signifies affirmation or negation:
c2a. each part being noun or verb,
c2b. whereas affirmation or negation is signified by voice-sound "which is composed from noun and verb" (ibid.).

B. Such VOICE-SOUNDS CONVENTIONALLY SIGNIFICATIVE, WHEREOF THE PARTS, IF SEPARATED, SIGNIFY SOMETHING AS A DICTION, NOT AS AFFIRMATION OR NEGATION, is called LOCUTION, OR DISCOURSE, or SPEECH (ORATIO). (Periherm. 16b, 26).

a. But NOTE:
al. That some discourse:
ala. can be composed from affirmations and negations as from parts, as in this example: 'Peter, who is a musician, is very old';
alb. But then each of these affirmations or negations is composed from 'dictions' or terms.
alc. And this example is a composite discourse.
ald. Wherefrom it is clear that what is essential to discourse is that its parts, if separated, signify "as dictions" or terms.

b. NOTE ALSO:
bl. That discourse differs from complex term (n.49, A):

bla. For a complex term is a complex of terms ('wise man') signifying several essences, as this complex of terms is only a part of some whole (the whole being a discourse), and therefore as this complex of terms is not a whole by itself.

blb. Whereas discourse:

blbl. is a sign of a composite understanding:

blbla. whether of one essence (as in definition, v.g. 'rational animal'),

blblb. or of several essences (as 'wise man'),

blb2. but always as taken as a whole by itself.

b2. Wherefore SPEECH or DISCOURSE or LOCUTION may be defined also: VOICE-SOUND, WHICH IS A WHOLE, SIGNIFYING COMPOSITE UNDERSTANDING. (Cf. In I Periherm. lect.3).

c. Accordingly, like a term:

cl. locution or discourse is an accidental concrete from matter (or subject) and form:

cla. its matter indeed is voice-sounds or vocables;

clb. but its form is composition of significations.

c2. And therefore a term which signifies an entire judgment (v.g. 'video'),

c2a. formally is not a discourse,

c2b. but:

c2bl. formally is a term,

c2b2. though virtually it is a discourse, for virtually it is this:('ego video - I see').

162. DIVISION OF DISCOURSE: Let us take:

A. These examples:

a. 'man is mortal';
b. 'rational animal';
c. 'wise man';
d. 'as he went past';
e. 'The spiritual is incorruptible;
  but human soul is spiritual;
  therefore human soul is incorruptible'.
f. 'O Peter';
g. 'is Peter sick?'
h. 'light a fire' (ignem accende);
i. 'please light a fire' (ignem accendas);
j. 'would that you would light a fire ' (utinam ignem accendas);

B. All these examples except the second, third and fourth:

a. Beget in the mind of the listener a perfect understanding, not leaving the listener's intellect in suspense:

b. For which reason they are called PERFECT discourses.

c. For PERFECT discourse is: DISCOURSE "WHICH GENERATES A PERFECT SENSE IN THE MIND OF THE HEARER" (In I Perihcrm, lect.7).

C. But the second, third and fourth examples (to wit: 'rational animal', 'wise man', 'as he went by'):

a. do not beget in the mind of the listener a perfect understanding, but rather leave his intellect in suspense:

b. For which reason they are called IMPERFECT discourses:

bl. discourses indeed, because they constitute a whole by themselves, - thus differing from a complex term:

bla. for 'wise man' as it is in a discourse, consists of two terms which do not constitute a whole by themselves: wherefore 'wise man' as it is in a discourse is merely a complex term;

blb. whereas 'wise man' as it stands alone outside some discourse wherein it would be a mere part, consists of two terms which constitute a whole by themselves: wherefore 'wise man' as it is not part of some discourse is an imperfect discourse.

c. For IMPERFECT discourse is: DISCOURSE WHICH DOES NOT BEGET A PERFECT SENSE IN THE MIND OF A HEARER.

D. But not all those other examples, which are perfect discourses, have themselves in the same way:

a. For one of them (to wit: 'man is mortal') is ENUNCIATIVE:
a1. For it expresses a judgment of the mind or an affirmation (or negation).
a2. For ENUNCIATION is DISCOURSE SIGNIFYING AN AFFIRMATION OR NEGATION; or, as we shall see later, DISCOURSE SIGNIFYING THE TRUE OR THE FALSE BY INDICATING.

b. But another of those examples, to wit, the fifth, (which is this: 'The spiritual is incorruptible; but human soul is spiritual; therefore human soul is incorruptible') is ARGUMENTATIVE:
b1. For it is the sign of a reasoning.
b2. For ARGUMENTATION is DISCOURSE SIGNIFYING THE SEQUENCE OF ONE FROM ANOTHER.

c. But the last five of those examples (to wit: 'O Peter', 'Is Peter sick', 'Light a fire', 'Please light a fire', 'Would that you would light a fire') are ORDINATIVE:
c1. For they express an ordinance of the intellect that something be done in the real.
c2. This ordinance of the intellect:
c2a. although it is not a judgment,
c2b. nevertheless:
c2b1. supposes a judgment of the intellect,
c2b2. and moreover a choice of the will,
c2c. inasmuch as it is a practical dictate.

d. But these ordinations are to be distinguished:
d1. according as:
d1a. the first ('O Peter') is VOCATIVE;
d1b. the second ('Is Peter sick?') is INTERROGATIVE;
d1c. the third ('Light a fire') is IMPERATIVE;
d1d. the fourth ('Please light a fire') is DEPRECATIVE;
d1e. the fifth ('Would that you would light a fire') is OPTATIVE.
d2. Which division is thus explained by St Thomas:
d2a. "Because intellect or reason not only conceives in itself the truth of some thing only, but also to its office it pertains to direct and order other things according to its concept, therefore it was necessary that, just as through enunciative discourse is signified the very concept of the mind, so also there be other discourses signifying an order of reason, according to which other things are directed.
d2b. "But from the reason of one man another man is directed to three things:
d2b1. "first indeed, to attend mentally; and to this pertains VOCATIVE DISCOURSE.
d2b2. "secondly, to respond vocally; and to this pertains INTERROGATIVE DISCOURSE.
d2b3. "thirdly, to execute in deed, and to this pertains:
d2b3a. "as regards inferiors, IMPERATIVE DISCOURSE;
d2b3b. "but as regards superiors, DEPRECATIVE DISCOURSE: to which is reduced OPTATIVE DISCOURSE: because with respect to a superior man has no motive power save through the expression of his desire." (IN I Periherm. lect.7, n.5).

E. Which division of discourse or locution may be thus exhibited schematically:-

SPEECH or DISCOURSE or LOCUTION is
- either IMPERFECT.
- or PERFECT: and then it is
  - either ENUNCIATION, or PROPOSITION.
  - or ARGUMENTATION.
  - or ORDINATION: which may be
    - either to attend mentally: and then it is VOCATION, or CALL.
    - or to respond vocally: and then it is INTERROGATION, or QUESTION.
    - or to execute in deed: and then
      - either towards inferiors: and then it is IMPERATION, or COMMAND.
      - or towards superiors: and then it is DEPRECATION or PRAYER (to which is reduced OPTATION).

F. It is to be noted that among imperfect discourses the chief place is held by those which are "modes of knowing", to wit:
a. definition;
b. and division.

....

CHAPTER THIRTEEN.

....

THE MODES OF KNOWING.

....

163. NOTION OF "MODE OF KNOWING": At the beginning the human intellect knows nothing perfectly, but its knowledges are obscure or confused or doubtful.

A. But the logical instrument, or instrument which our intellect uses to perfect its knowledge is called a "MODE OF KNOWING".

B. Therefore a MODE OF KNOWING is defined: A DISCOURSE MANIFESTATIVE OF SOME UNKNOWN - 'ORATIO ALICUIUS IGNOTI MANIFESTATIVA'.

C. In which definition 'unknown' is taken for:
a. 'obscure',
b. or 'confused',
c. or 'doubtful'.

164. DIVISION OF THE MODES OF KNOWING: The unknown to be manifested may be either something incomplex (simple) or a complex truth.

A. That which is incomplex, or the simple essence of a thing, is manifested:
a. as regards its constitution, by DEFINITION;
b. as regards its parts, by DIVISION.

B. But a complex truth, i.e. a logical truth, which is found only in judgment, which is (logically) complex, is manifested by PROOF or ARGUMENTATION.

C. Therefore the modes of knowing are three, to wit:
a. DEFINITION,
b. DIVISION,
c. ARGUMENTATION.

D. BUT NOTE:

a. That TERM is not a logical instrument or mode of knowing save remotely:

a1. For not by terms do we perfect our knowledge, save insofar as they are conjoined to each other in some special way, or, in other words, save insofar as from them are formed definitions, or divisions or argumentations,

a2. which themselves are the very modes of knowing here in question.

b. That sensible experience whereby we know the truth of a fact, is not a mode of knowing, for the truth of a fact known by sensible experience does not need a medium whereby to be manifested.

c. That faith, whereby something is believed on account of the testimony of a witness, is not a mode of knowing, because:

c1. it does not manifest the thing itself,

c2. but leaves it obscure.

d. that LOGIC itself is indeed a mode of knowing:

d1 in universal,

d2. but not in special.

……

CHAPTER FOURTEEN.

DEFINITION ITSELF.

165. ORDER OF PROCEDURE: The treatment of definition itself:

A. Will consider:

a. First, the nature of definition.

b. Secondly, the species of definition.

c. Thirdly, the laws of definition.

d. Fourthly, the origin of definitions: which will be considered:

d1. In the first place, in general;

d2. In the second place, in special: which is the consideration of the pursuit of definition, which will be dealt with:

d2a. as to its nature;

d2b. as to its modes.

B. Hence the following order:-

On definition itself:
- Its nature..Article one.
- Its species..Article two.
- Its laws...Article three.
- Its origin
  - in general.................................Article four.
  - in special: Its pursuit
    - Nature thereof...Article five.
    - Modes thereof....Article six.

……

ARTICLE ONE.

NATURE OF DEFINITION.

166. DEFINITION OF DEFINITION: The reason which necessitates definition will manifest its nature.

A. And indeed the natural imperfection of our intellect:

a. which only step by step and only by the aid of several concepts distinctly apprehends the natures of things,
b. requires the substitution:
b1. of some locution signifying the composite understanding or the several concepts of the same thing,
b2. for the vocable signifying that thing by a single concept.

B. But:
a. This substitution:
a1. which not only signifies the thing,
a2. but manifests it,
b. is called the act of defining.

C. Therefore DEFINITION is "A LOCUTION SIGNIFYING WHAT SOMETHING IS - ORATIO SIGNIFICANS QUOD QUID EST". (In II Post. Anal. lect.2).

a. Let us take the definition of man: 'rational animal'.
a1. This definition:
a1a. consists of two concepts, to wit:
a1a1. the concept 'animal',
a1a2. and the concept 'rational':
a1b. but both are concepts about the same essence.
a2. It is otherwise if one says: 'wise man':
a2a. To these vocables correspond indeed:
a2a1. two concepts,
a2a2. yet expressing two essences, to wit, the essence 'man' and the essence 'wisdom'.
a2a3. and therefore it is a complex concept (cf. n.49, A.b).
a2b. But:
a2b1. 'rational animal' is a composite understanding of an incomplex concept (cf. n.49, A.a),
a2b2. and for that reason definition is said to be a LOCUTION.
a3. For LOCUTION is defined: VOICE-SOUND SIGNIFYING A COMPOSITE UNDERSTANDING - whereas the sign of a complex concept is a complex term (cf. n.65).

b. But this locution or discourse is imperfect:
b1. since its object is:
b1a. an imperfect understanding or an object of simple apprehension:
b1b. not an object of judgment.
b2. And therefore this locution or discourse is said to signify:
b2a. 'that which something is' (cf. nn.16, 25).
b2b. not affirmation or negation.

....

ARTICLE TWO.

DIVERSE SPECIES OF DEFINITIONS.

167. NOMINAL AND REAL DEFINITION: However:

A. The manifestation of some defined is accomplished:
a. whether by the unfolding of its sign, i.e. of its name,
b. or by the unfolding of the signified, i.e. of the nature signified.

B. Whence a twofold genus of definitions, to wit:
a. definition of the name, or NOMINAL definition;
b. and definition of the thing, or REAL definition.

168. SPECIES OF NOMINAL DEFINITION: But nominal definition is divided into two species:

A. For a nominal definition:
a. unfolds:

a1. either the ETYMOLOGY OF THE NAME,
a2. or its COMMON SIGNIFICATION, or meaning.
b. Wherefore there are two nominal definitions, to wit:
b1. ETYMOLOGICAL definition,
b2. and VULGAR or POPULAR or COMMON-SENSE definition.

B. It is to be noted that "other is the etymology of a name, and other its signification.
a. "For its etymology is taken according to that wherefrom the name is imposed for the purpose of signifying;
b. "But the signification of a name is taken according to that whereupon the name is imposed for the purpose of signifying it.
c. "Which sometimes are diverse:
c1. "for the name 'lapis' (stone) is imposed from 'laesio pedis' (hurting of foot);
c2. "yet it does not signify this: otherwise iron, since it hurts the foot, would be a 'lapis' (stone). (II-II, q.92, a.1, ad 2).

C. Accordingly:
a. ETYMOLOGICAL definition:
a1. is most incomplete,
a2. and has itself in science quite materially and secondarily.
b. On the other hand:
b1. VULGAR definition, even when very imperfect:
b1a. is the foundation of the real definition.
b1a1. For it is based in common sense,
b1a2. and signifies the quiddity of the name, as Cajetan explains in the following words:
b1a2a. "Just as the 'what' of a thing (quid rei) is the quiddity of the thing (quidditas rei), so the 'what' of the name (quid nominis) is the quiddity of the name (quidditas nominis).
b1a2b. "But a name:
b1a2b1. "since it is essentially a note of those conceptions which are objectively in the mind (from I Periherm. 16 a 3),
b1a2b2. "has no other quiddity save this that it is the sign of some thing understood or thought:
b1a2c. "But sign, as such, is relative to signed.
b1a2d. "Wherefore to know the 'what' of a name is naught else than to know to what such a name has relation as sign to signed.
b1a2e. "But such knowledge can be acquired through the accidentals of that signed, through its common (characters), through its essentials, through nods, and in any other way, just as if a Greek, when we ask him the 'what' of the name 'anthropos', points out a man with his finger, we at once perceive the 'what' of the name." (In 'De Ente et Essentia', prooemium, n.8, ed. Laurent p.19).
b1b. Whence it appears that the 'what' of a name, which is, as Cajetan explains, the quiddity of the name, is nothing else than what the name means of signifies.
b2. Wherefrom it is apparent that by VULGAR definition something of the thing is already known, though confusedly. (Cf. n.51, C.a).

169. SPECIES OF REAL DEFINITION: Real definition manifests an essence DISTINCTLY.

A. Therefore this manifestation is made in as many ways as there are ways in which an essence can be known distinctly. (Cf. n.51, C.b).

B. Therefore real definition is manifold:

a. The definitions of 'man', to wit: RATIONAL ANIMAL, or BEING CONSISTING OF BODY AND RATIONAL SOUL, which EXPRESS THE ESSENTIAL PRINCIPLES of man, are called ESSENTIAL DEFINITIONS.
a1. But of these:
a1a. The former, to wit 'rational animal', is METAPHYSICAL (cf. I, q.15, a.4; I-II, q.1, a.3), because it is made through genus and specific difference, which are not really distinct from each other.

a1b. But the latter, to wit 'being consisting of body and rational soul', is called PHYSICAL (cf. In Boeth. V, 3), because it expresses the physical, or really distinct, principles of the essence.

a2. Such definitions:

a2a. are, as is clear, the most perfect,

a2b. but they are not always possible, because in most cases we do not know the specific difference of things. (Cf. n.51, D.b).

a3. Even further:

a3a. of each of these definitions is it true that it is found only:

a3a1. in philosophy,

a3a2. and in mathematics;

a3b. but not in the positive sciences which do not know essences save THROUGH OBSERVABLE OR EMPIRIOLOGICAL PROPERTIES; as is manifest from the definitions of chemical bodies.

b. A definition of this kind is called DESCRIPTIVE:

b1. But:

b1a. Not all descriptive definitions are made through properties or PROPER accidents.

b1b. Descriptive definition is also made through COMMON accidents, but so enumerated that not all are found together in another: such is the definition of man: 'two-legged, featherless, upright, animal, emitting speech-sounds, emitting laughter-sounds'.

b2. Whereas:

b2a. descriptive definition through properties is called PROPER definition,

b2b. descriptive definition through common accidents is called ACCIDENTAL definition.

b3. NOTE WELL:

b3a. that PROPER descriptive definition:

b3a1. which is found:

b3a1a. both in philosophy (v.g. 'social animal' as a definition of man),

b3a1b. and in positive science,

b3a2. does not express in each of these genera of disciplines THE SAME properties.

b3b. For proper descriptive definition expresses:

b3b1. in philosophy the PHILOSOPHICAL properties which immediately flow from the essence,

b3b2. but in positive science the SCIENTIFIC, or observable or empiriological properties, which ARE ONLY SIGNS of the philosophical properties, which latter are impervious for positive science.

c. Besides those definitions, there is also CAUSAL DEFINITION, which expresses an essence THROUGH ITS EXTRINSIC CAUSES, to wit, final cause, efficient cause, or exemplary cause.

c1. Thus:

c1a. If human soul be defined: 'form immediately created by God',

c1a1. there is had a DEFINITION THROUGH EFFICIENT CAUSE:

c1a2. and indeed a CAUSAL definition, which is: DEFINITION INDICATING THE PRODUCTIVE CAUSE OF A THING.

c1b. But often, especially in mathematics, it INDICATES THE MANNER OF PRODUCTION OF A THING: as when circle is defined: 'plane figure resulting from the movement of a straight line revolving about its fixed extremity': and then it is called a GENETIC definition.

c2. But:

c2a. If human soul is defined: 'soul whose end is enjoyment of God':

c2b. then is had DEFINITION THROUGH FINAL CAUSE, which is DEFINITION INDICATING THAT ON ACCOUNT OF WHICH THE THING IS MADE.

c2c. And:

c2c1. "since end (is) the cause of causes..........

c2c2. "definition which is taken from end is more formal among all definitions." (In II Sent. d.9, q.1, a.1 ad 1).

c3. But:

c3a. If human soul is defined: 'image of God':

c3b. then is had DEFINITION THROUGH EXEMPLARY CAUSE, which is DEFINITION INDICATING THAT UNTO THE IMITATION WHEREOF THE THING IS MADE.

170. SCHEMATIC SUMMARY: Accordingly the division of definition may be thus exhibited schematically:-

DEFINITION is

- either NOMINAL: and then
  - either ETYMOLOGICAL.
  - or VULGAR, or COMMON-SENSE.
- or REAL: and then
  - either through INTRINSIC causes; and then
    - either ESSENTIAL: and then
      - either METAPHYSICAL.
      - or PHYSICAL.
    - or DESCRIPTIVE: and then
      - either PROPER.
      - or ACCIDENTAL.
  - or through EXTRINSIC causes: and then
    - either through EFFICIENT CAUSE: and then
      - either CAUSAL.
      - or GENETIC.
    - or through EXEMPLARY CAUSE.
    - or through FINAL CAUSE.

……………………………

ARTICLE THREE.

LAWS OF DEFINITION.

171. LAWS OF THE THING TO BE DEFINED: Of the laws which concern definition, three regard the THING to be defined:

A. FIRST LAW: THE THING TO BE DEFINED MUST BE UNIVERSAL. (In II Post. Anal., lect.2).

a. For definition is a sign of the universal. (cf. n.22).

b. And so the singular cannot be defined. (Cf. In VII Metaphys. lect. 15, ed. Cathala n.1611).

B. SECOND LAW: THE THING TO BE DEFINED MUST BE ONE NATURE (UNUM PER SE).

a. For otherwise there would be many to be defined. (Cf. IN VII Metaphys. lect.4; ed. Cathala n.1339).

b. Therefore:

b1. by essential definition, simply speaking complete substance alone can be defined;

b2. whereas:

b2a. on the other hand:

b2a1. incomplete substances,

b2a2. and accidents,

b2b. are defined "through an added" (I, q.76, a.8 ad 2; I, q.40, a.1; Q.Disp. de Anima, a.9, ad 15 et ad 7; Quodlib. IX, a.6 ad 3), or, in other words, through something which is outside the essence of the defined. (Quodlib. IX, a.5 ad 1; De Pot. q.8, a.4 ad 5; De Verit. q.16, a.1 ad 8; In II Sent. d.35, a.1, a.2 ad 1).

C. THIRD LAW: THE THING TO BE DEFINED MUST BE CONTAINED UNDER A GENUS.

a. For:

a1. Since definition is manifestative of the thing,

a2. definition must be made through those concepts which are prior. (Cf. n.144).

b. But genus and difference manifest the essence of a thing. (Cf. In VII Metaphys. lect.3, ed. Cathala, n.1327).

172. LAWS OF DEFINITION ITSELF: And three other laws regard the DEFINITION itself:

A. FIRST LAW: THE DEFINITION MUST BE CLEARER THAN THE DEFINED.

a. For otherwise the definition would not be manifestative of the defined.

b. Therefore the defined ought not enter the definition:

b1. for otherwise there would be a circle in defining,

b2. and hence no manifestation of the defined. (Cf. In I Metaphys. lect.9, ed.Cathala n.138).

B. SECOND LAW: THE DEFINITION OUGHT TO BE MADE THROUGH GENUS AND DIFFERENCE.

a. "And because this condition:

a1. "not only embraces essential definition in which genus and difference are properly found,

a2. "but also accidental and descriptive (definition) in which genus and difference are not properly, but something INSTEAD OF THEM,

b. "Therefore we understand:

b1. "by the name 'genus', SOMETHING COMMON,

b2. "by the name 'difference' SOME PARTICULAR DISTINCTIVE." (John of St Thomas, Cursus Phil. I, c.3, p.19).

C. THIRD LAW: THE DEFINITION MUST BE NEITHER BROADER NOR NARROWER THAN THE DEFINED, BUT CONVERTIBLE WITH IT.

a. For otherwise the definition "does not unfold the nature (of the defined);

a1. "for it attributes to it something, which it has not,

a2. "or takes from it something, which it has." (John of St Thomas, ibid.).

b. Thus:

b1. If man is defined 'sensitive living body', the definition is broader than the defined, and "takes from it something", to wit, 'rational', "which it has."

b2. But if man is defined 'educated animal', the definition is narrower than the defined, and "attributes to it something", to wit, 'education', "which it has not."

……

ARTICLE FOUR.

ORIGIN OF DEFINITIONS.

173. NOT THROUGH DEMONSTRATION: Not through demonstration is definition obtained. (Post.Anal. II, c.8, n.13; c.3; c.4; Comm.S.Thomae in hos locos, lect.7 in fine; lect.2 et 3).

A. For if definition were obtained through demonstration, then the conclusion of the syllogism would be convertible, for:

a. the subject would be the defined,

b. and the predicate would be the definition.

B. But to obtain such a conclusion:

a. the premisses would need to be convertible;

b. and therefore M would need to be a definition of the defined (i.e. of S).

c. Wherefore the demonstration would be such as this:-

M P
'A social animal.......is.......a rational animal.

S M
But........man.............is........a social animal.

S P
Therefore........man.............is.......a rational animal.'

C. Therefore this demonstration would already suppose a definition.

174. NOR THROUGH INDUCTION PROPERLY SO-CALLED: Neither through induction properly so-called is definition obtained.

A. For induction properly so-called is concerned with propositions.

B. But definition pertains to the first operation of the mind.

175. THEREFORE THROUGH ABSTRACTION: It follows that definition is obtained through abstraction.

A. But this abstraction is not effected by one single act.
a. For our intellect, by one single act, abstracts only most confused concepts,
b. which are not sufficient for the manifestation of the defined.

B. Whence the necessity of definition,
a. which substitutes diverse concepts for the defined;
b. and therefore the labour of finding a definition consists in seeking the concepts whereof the definition is composed.

C. This labour is called PURSUIT of a definition (venatio definitionis). (Post. Anal. II; Comment. S.Thomae, lect.16).

....

ARTICLE FIVE.

NATURE OF PURSUIT OF DEFINITION.

176. EQUIPMENT PRE-REQUIRED: For the understanding of the pursuit of a definition, it is to be noted:

A. That the thing to be defined is known confusedly (i.e. according to a nominal definition) before it is defined.
a. For otherwise there would be no knowledge of what one is seeking to define.
b. Nor would the definition be known to be good when it has been obtained.

B. But before the defined is known:
a. its genus is known, NOT INDEED AS IT IS PART OF THE DEFINED, but AS IT IS IN ITSELF.
a1. For the more universal is known before the less universal;
a2. but the defined is less universal than the genus which must enter the definition.
b. Thus:
b1. "animal considered in itself is before man in our knowledge;
b2. "but man is earlier in our knowledge than that animal is part of his nature." (I, q.85, a.3 ad 2).

177. DIVERSE PRIORITIES: "Thus accordingly.........the defining concepts" (i.e. the elements of the definition):

A. "Absolutely considered, are known before the defined: otherwise the defined would not be made known through them.

B. "But according as they are parts of the definition, thus they are known after it.
a. "For we know man by a certain confused knowledge,
b. "before we know to distinguish those characters which are of the nature of man." (Ibid. ad 3; cf. In I Phys. lect.1).

178. NATURE OF THE PURSUIT: Therefore the whole labour of the pursuit of a definition consists in determining such defining concepts AS THEY ARE PARTS OF THE DEFINED.

....

ARTICLE SIX.

MODES OF PURSUIT OF DEFINITION.

179. TWO WAYS: There are two ways of pursuing definition, to wit:

A. The DESCENDING WAY or WAY OF DIVISION. (Post. Anal. II; Comment. S.Thomae, Lect.14-15).

B. The ASCENDING WAY or WAY OF COMPOSITION. (Post.Anal. II; Comment. S.Thomae, lect.16).

180. DESCENDING PURSUIT: Since "every good definition, that it may unfold some nature, ought to unfold it through that which is common to it with others and through that which is proper to itself and distinguishes it from all others." (John of St Thomas, Cursus Phil. I, p.19):

A. The descending pursuit of a definition OUGHT to:

a. STATE THE SUPREME GENUS OR CATEGORY OF THE THING TO BE DEFINED: Which is easily done, since:
a1. On the one hand, already before the real definition, the thing to be defined is know confusedly or, in other words, by nominal definition (n.172, A);
a2. and on the other hand, the genus of the thing to be defined is known in itself, as being more universal (n.172, B).

b. DIVIDE THROUGH OPPOSITE DIFFERENCES, PROPER AND IMMEDIATE:

b1. Through OPPOSITE differences indeed:
b1a. That is, as substance is divided through extended and inextended, or through simple and composite, or through material and immaterial; - (simple and inextended would not be opposite; nor would biped and irrational be opposite, as is evident from bird; nor would biped and rational be opposite, as is evident from man).
b1b. The reason of this condition is that otherwise:
b1b1. either the members into which the genus is divided do not exhaust the genus, but leave a gap; and it might happen that the thing whereof the definition is sought lies in that gap. (Thus biped and rational do not exhaust animal, but leave a gap, in which gap dog lies);
b1b2. or the members do not exclude each other, and accordingly do not differ from each other. (Thus biped and irrational do not exclude each other, as is evident from bird).

b2. but through PROPER differences:

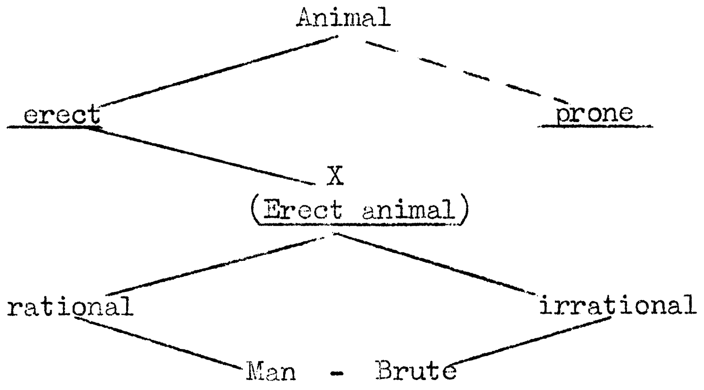
b2a. That is, through differences not found beyond the genus. (Thus, if animal were divided through erect and prone, or through white and not-white, these differences are found outside animal:

b2a1. for erect and prone are found in plant: for a plant is either erect, as a tree; or prone, as a vine,

b2a2. and white and not-white are found in minerals.

b2b. The reason of this condition will be clear from an example:

b2b1. Let this example be taken:-



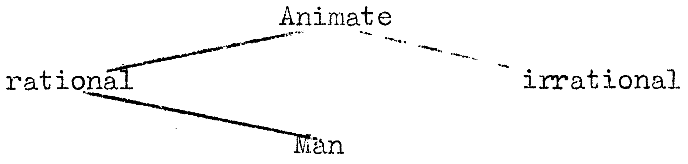
b2b2. Then it is implied that 'brute' is an inferior of X (erect animal), so that X would be necessarily predicated of brute: which is false, for there are animals which are prone (as worm), and whereof 'erect' cannot be said.

b3. And through IMMEDIATE differences:

b3a. That is, through differences constitutive of inferiors whereto the genus befits without the medium of some subaltern genus. (Thus, if 'animate' were divided through the differences 'rational' and 'irrational', the difference 'rational' constitutes an inferior, to wit, 'man', whereto 'animate' befits only by the medium of a subaltern genus 'animal').

b3b. The reason of this condition is clear from an example:-

b3b1. Let this example be taken:



b3b2. Then is omitted something of the intelligible content of 'man', to wit, 'sentient' and 'animal', so that the nature of man, or, in other words, the intelligible content of man, is not manifested or unfolded. For it must be recalled that definition:

b3b2a. is a locution unfolding or manifesting a nature, i.e. setting forth the intelligible content of a nature, or, in other words, signifying WHAT man is (n.162),

b3b2b. and not merely indicating WHICH thing is man: (which indeed would be sufficiently done if it were said that man is 'rational body', and which also, indeed, is sufficiently done already by vulgar definition).

c. ADMIT NO GAPS IN SUBDIVISIONS:

c1. (As a gap would be admitted if animal is divided into vertebrate, anthropod and annelid; mollusc being omitted).

c2. For it may happen that that whereof the definition is sought lies in the gap: in which case either its definition will not be achieved, or it will be defined badly).

d. GIVE THE ULTIMATE DIVISION FOR THE ULTIMATE DIFFERENCE:

d1. The ultimate division being that beyond which, if a further division is made, the diverse members constituted by this further division do not differ specifically from that whereof the definition is sought. Thus, if man is to be defined, the ultimate difference is 'rational'; for if beyond division according to 'rational' and 'irrational' some further division is made, such as the division of 'rational animal' through 'white' and 'non-white', then the diverse members constituted through these differences (to wit, 'white-man' and 'non-white-man'), are each specifically the same as 'man'.

d2. This ultimate difference, as thus explained, is accordingly to be given as the specific difference.

e. PUT THAT DIFFERENCE AS ULTIMATE ACCORDING TO ORDER:

e1. For:

e1a. not only is it necessary that the due concepts be included in the definition,

e1b. but also they must be set in the due order.

e2. Thus, if 'animal' is divided through the differences 'vertebrate' and 'invertebrate':

e2a. not rightly would 'animal vertebrate' be said, as if there were other vertebrates besides animal vertebrates,

e2b. but rather 'vertebrate animal' must be said.

f. BE CONFIRMED FROM THE ASCENDING WAY, - which will be dealt with in the next paragraph (n.131).

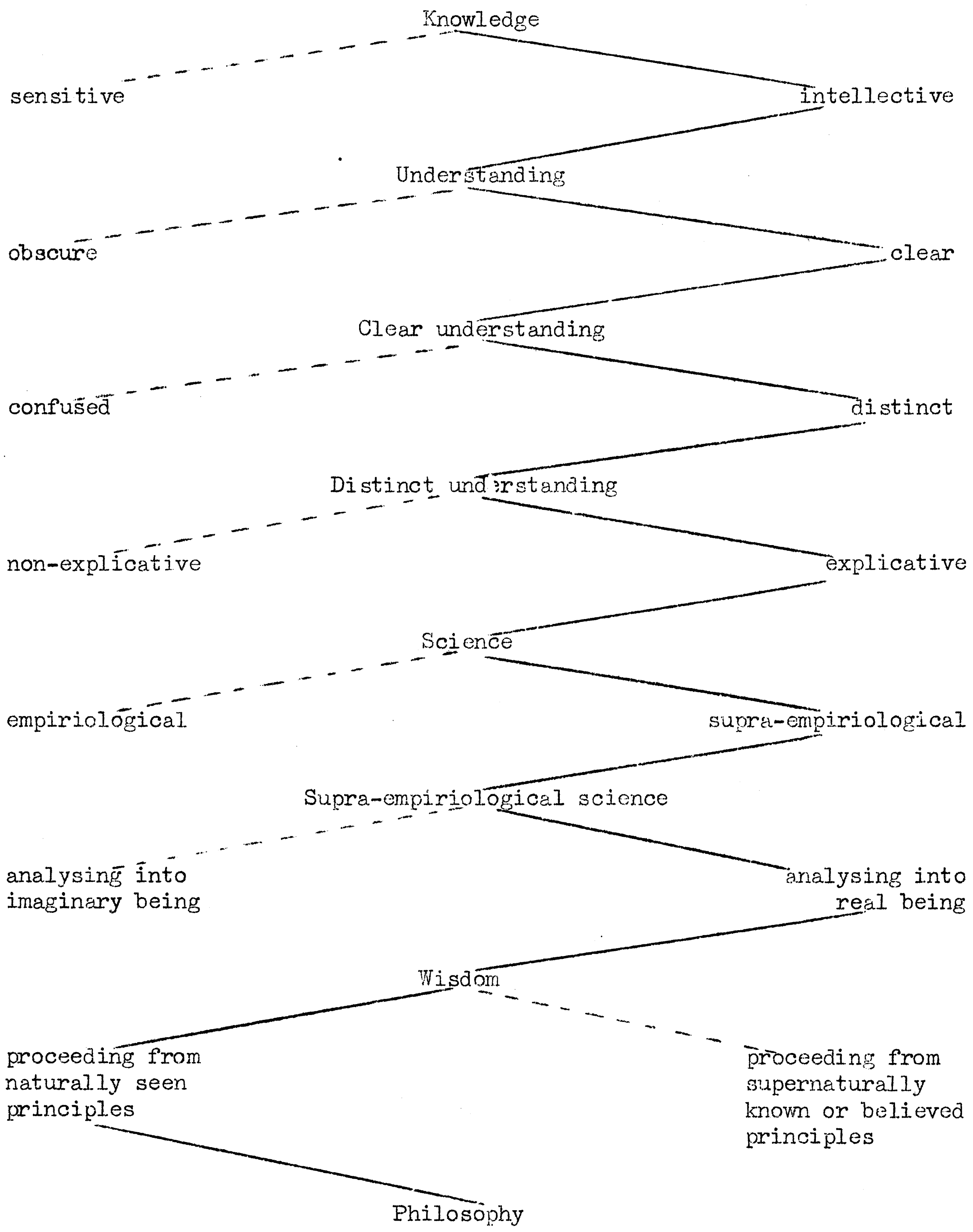
B. As an example of a definition achieved by a descending pursuit, take the definition of man as it is gather from the tree of Porphyry (n.128), to wit: 'rational animal'.

a. Where the ultimate difference is 'rational': which difference alone of all the differences is to be indicated, since all the other differences are included in 'animal'.

b. And where the lowest genus is 'animal': which genus alone of all the genera is to be indicated, for all the other genera are included in it.

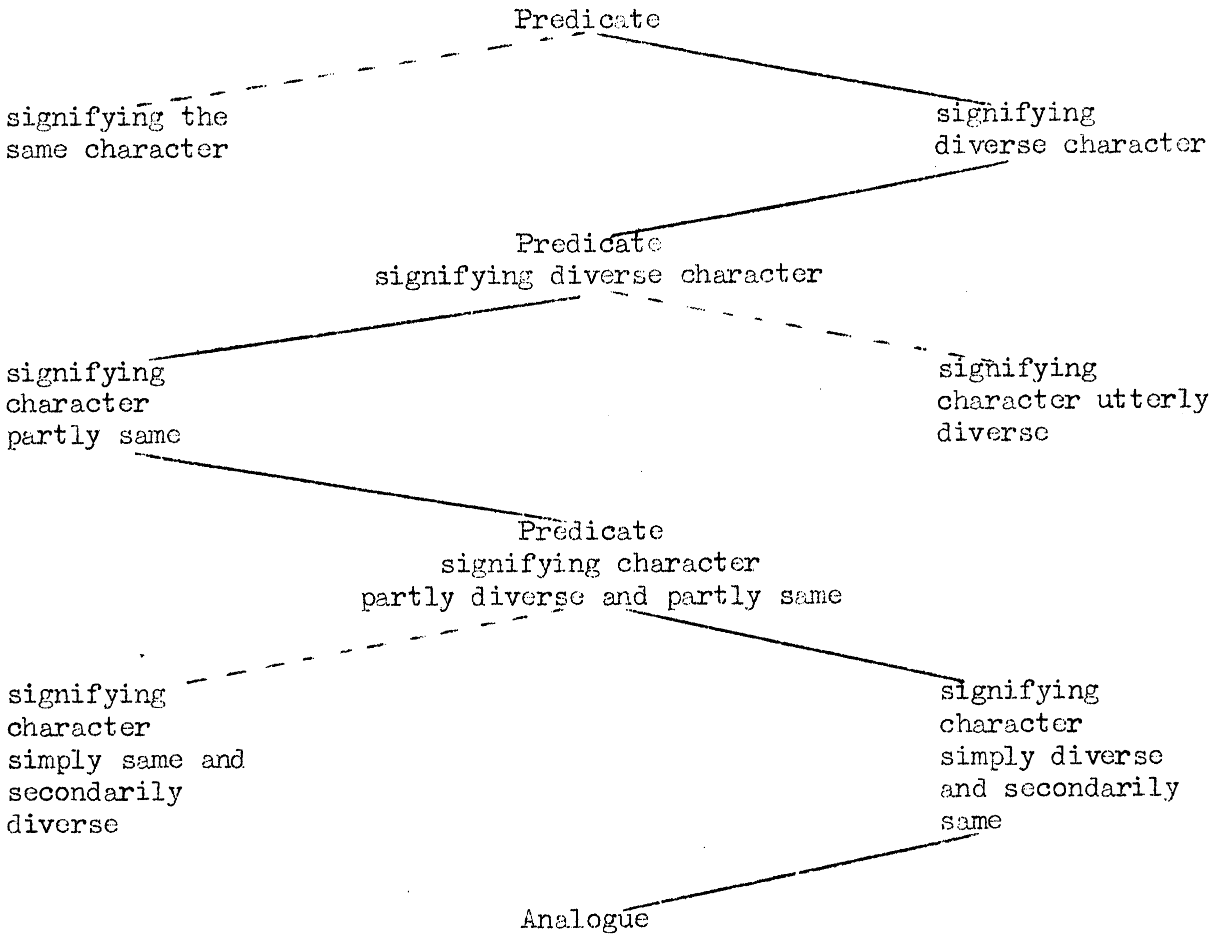
C. As another example of a descending pursuit, take the pursuit of the definition of philosophy enacted in the introduction to philosophy:

a. Which pursuit may be thus summarized schematically:-



b. Wherefore philosophy is defined: Natural wisdom, or science through supreme causes proceeding under the natural light of the principles of reason.

D. As a further example of a descending pursuit, take the pursuit of the definition of analogue conducted here-above (nn.149-151): which pursuit may be thus schematically summarized:-


Predicate
signifying the same character
signifying diverse character
Predicate signifying diverse character
signifying character partly same
signifying character utterly diverse
Predicate signifying character partly diverse and partly same
signifying character simply same and secondarily diverse
signifying character simply diverse and secondarily same
Analogue

181. ASCENDING PURSUIT: This is explained by Aristotle (Anal. Post. II, c.13, n.97b;) and by St Thomas in his commentary thereupon (lect.16). (Cf. De Tonquedec, Critique de la Connaissance, p.350).

A. This ascending pursuit OUGHT to:

a. First, ACCURATELY OBSERVE THE THING TO BE DEFINED:
a1. both IN ITSELF,
a2. and IN ITS SIMILARS.

b. Secondly, IN LIKE FASHION OBSERVE DISSIMILARS.

c. Thirdly, COMPARE THE SIMILARS WITH THE DISSIMILARS in order to see whether they agree in some one character.
c1. If they are found to agree in some one character, that character will be the genus or "something common" (cf. n.172, B).
c2. That genus is accordingly clearly stated.

d. Fourthly, COMPARE THE SIMILARS WITH THE DISSIMILARS in order to see in what they differ.
d1. Those things through which they differ will be their differences or "particular distinctives" (cf. n.172, B).
d2. The difference pertaining to the similars will be the difference of the THING TO BE DEFINED or its "particular distinctive".

e. Fifthly, BE CONFIRMED FROM THE DESCENDING WAY.

B. This process will be made clear from an example: let us suppose that we are pursuing a definition of philosophy:

a. First, let us select ARISTOTLE (or Aristotle and Plato):
a1. For all agree that Aristotle is a philosopher; (here we are using the confused knowledge of what philosophy or philosopher is; or, in other words, a nominal or common-sense definition).
a2. Therefore that whereby Aristotle is a philosopher, or that which is proper to him AS A PHILOSOPHER will be philosophy.

b. Secondly, let us consider those who are LIKE ARISTOTLE (or like Aristotle and Plato): like them are:

b1. Parmenides,
b2. Socrates,
b3. Avicenna,
b4. Averroes,
b5. Descartes,
b6. Leibnitz,
b7. Kant,
b8. Hegel,
b9. Bergson.

c. Thirdly, let us consider those who are UNLIKE ARISTOTLE (or unlike Aristotle and Plato): unlike them are:

c1. Copernicus,
c2. Galileo,
c3. Kepler,
c4. Pasteur,
c5. Euclid,
c6. Achimides,
c7. Gauss,
c8. G.G. Jacobi,
c9. St Gregory Nazianzen,
c10. St Austin,
c11, St Prosper,
c12. St Anselm.

d. Fourthly, let us compare those who are ALIKE with those who are UNLIKE, in order to see whether they agree in some one character.

d1. We find that they all agree in this, that they have SCIENCE.

d2. Therefore we lay it down that science is the GENUS under which philosophy is contained.

e. Fifthly, let us compare those who are ALIKE with those who are UNLIKE, in order to see THROUGH WHAT THEY DIFFER.

e1. We find that Aristotle and Plato and those who are like them, differ:

e1a. From Copernicus, Galileo, Kepler and Pasteur in this, that:

e1a1. whereas these have experimental science,

e1a2. Aristotle, Plato and those who are like them, have a supra-experimental science.

e1b. And from Euclid, Achimides, Gauss and Jacobi in this, that:

e1b1. whereas these have science which analyses its concepts into imaginary being,

e1b2. Aristotle, Plato and those who are like them have science which analyses its concepts into real being.

e1c. And from St Gregory, St Austin, St Prosper and St Anselm, in this:

e1c1. whereas these have science which explains from principles divinely revealed and believed,

e1c2. Aristotle, Plato and those who are like them, have science which explains from principles naturally known and seen.

e2. Therefore we lay it down that the difference or "particular distinctive" of philosophy, whereby it is distinguished from other sciences consists in this character, to wit: Supra-experimental, analysing its concepts into real being, and explaining from naturally seen principles.

f. Accordingly we DEFINE philosophy: Supra-experimental science, analysing its concepts into real being, and explaining from naturally seen principles. Which definition is indeed not other than that reached by the descending way (n.180, C).

182. VALUE OF THESE PURSUITS: From what has been said regarding these two pursuits:

A. It is clear:

a. that definition is in no way posited 'a priori', but is based upon, or elaborated from, things.

b. And this remains true, even if the definition is reached by the descending way, since the supreme genus, known previously, is known by means of abstraction from sensibles.

B. But the value of these pursuits cannot be understood:
a. either by Empirists or Positivists, who:
a1. denying that we can abstract NATURES from individuals,
a2. think that those who define construct definitions 'a priori'.
b. Or by Idealists, who:
b1. in the stead of this abstractive process,
b2. substitute a PURELY constructive ability of our intellect.

……

CHAPTER FIFTEEN.

THE PRINCIPAL INSTRUMENT OF DEFINITION, WHICH IS DIVISION.

183. ORDER OF PROCEDURE: Since division is the distribution of a whole into its parts:

A. This treatment of division will consider:
a. First, whole and part.
b. Secondly, division: and indeed:
b1. In the first place, the nature of division.
b2. In the second place, the kinds of division.
b3. In the third place, the laws of division.

B. Hence the following order:-

On division	On the whole and part		Article one.
	On division itself	Its nature	Article two.
		Its kinds	Article three.
		Its laws	Article four.

……

ARTICLE ONE.

WHOLE AND PART.

184. NOTION OF WHOLE: Something is called whole in two ways, to wit:

A. "Whole or wholeness is said in one way ABSOLUTELY, and thus whole is the same as perfect.

B. "In another way whole is said THROUGH COMPARISON TO PARTS." (St Bonaventure, In I Sent. d.19, p.2, a.1, q.1, resol.; cf. St Thomas, In Dion. De Div. Nomin. c.2, lect.1).

a. It is with whole taken in this latter way that we are concerned here, where it is question of a whole as it is that which is divided;

b. and thus taken WHOLE is: ONE CONSIDERED THROUGH REFERENCE TO ITS PARTS.

185. NOTION OF PART: Accordingly:

A. Since "the parts of a thing are those into which the whole is divided materially:

a. "for the parts have themselves to the whole as matter to form;

b. "wherefore (hysic. II.):

b1. "the parts are placed in the genus of material cause,

b2. "but the whole in the genus of formal cause." (III. q.90, a.1; cf. In II Physic. lect.5).

B. Therefore a PART is: ONE OF THOSE INTO WHICH A WHOLE IS DIVIDED MATERIALLY.

186. KINDS OF WHOLE: Let us take:

A. These examples:
a. 'animal'.
b. 'man'.
c. 'existing man'.
d. 'human soul'.
e. 'being'.
f. 'knowledge'.
g. 'heap'.
h. 'white man'.
i. 'litter'.
j. 'family'.
k. 'state'.
l. 'white'.

B. Of these examples:

a. Some (v.g. 'animal') are ONE 'PER SE', i.e. that whose be is one.

b. But a whole WHEREOF THE BE IS ONE is called WHOLE 'PER SE' (whole of itself, whole of its own nature).

C. But:

a. other (v.g. 'white man') are ONE 'PER ACCIDENS', i.e. that whose be is many: for:

a1. other is the be of man,

a2. and other is the be of whiteness.

b. But a whole WHEREOF THE BE IS MANY is called WHOLE 'PER ACCIDENS' or ACCIDENTAL WHOLE.

D. But a WHOLE OF ITSELF (per se), may be considered:

a. either REALLY, i.e. as a real nature: and thus considered it is called a REAL WHOLE.

b. or LOGICALLY, i.e. as a logical universal: and thus considered it is called a LOGICAL OR UNIVERSAL WHOLE.

E. But a WHOLE OF ITSELF (v.g. 'man') TAKEN AS A REAL WHOLE:

a. may be taken through reference to parts expressing its essence: and thus taken it is called an ESSENTIAL WHOLE: but the parts of its essence relatively to which it is taken, may be:

a1. either the PHYSICAL parts of the essence, i.e. relatively to the parts which are really distinct from each other (as the parts of man really distinct from each other are soul and body): and thus taken it is called a PHYSICAL WHOLE.

a2. or the METAPHYSICAL parts of the essence, i.e. relatively to the metaphysical degrees which are not really distinct from each other (as 'animal' and 'rational' are parts of man): and thus taken it is called a METAPHYSICAL WHOLE.

b. Or may be taken through reference to parts not expressing the essence: and thus taken it is called a NON-ESSENTIAL WHOLE: but the parts relatively to which it is taken may be:

b1. either ENTITATIVE parts (v.g. as 'existing man' consists of 'man' and 'existence (be)': and thus taken it is called an ENTITATIVE WHOLE.

b2. or INTEGRAL or quantitative parts (v.g. as 'man' consists of 'head' 'neck', 'trunk', 'arms' and 'legs'): and thus taken it is called an INTEGRAL WHOLE.

b3. or POTESTATIVE parts or degrees of power (v.g. as 'human soul' consists of 'vegetative soul', and 'sensitive soul' and 'intellective soul'): and thus taken it is called a POTESTATIVE WHOLE.

F. But a WHOLE OF ITSELF (v.g. 'animal', 'man', 'being', 'knowledge') TAKEN AS A LOGICAL OR UNIVERSAL WHOLE, consists of parts which are its inferiors: but these inferiors may be:

a. either inferiors whereof the whole is predicated UNIVOCALLY (as 'animal' and 'man' are predicated univocally of their inferiors): and then the whole is called a UNIVOCAL WHOLE: which is:

a1. either GENUS such as 'animal': and then it is called a GENERIC WHOLE; - whereof the parts are SPECIES.

a2. or SPECIES such as 'man': and then it is called a SPECIFIC WHOLE, - whereof the parts are INDIVIDUALS.

b. or inferiors whereof the whole is predicated ANALOGICALLY (as 'being' or 'knowledge' are predicated analogically of their inferiors): and then the whole is called an ANALOGOUS WHOLE, - whereof the parts are MODES.

G. But:

a. just as a WHOLE OF ITSELF (per se) may be taken either really or logically (cf. D),

b. so also may an ACCIDENTAL WHOLE be taken:

b1. either REALLY, i.e. as a REAL WHOLE,

b2. or LOGICALLY, i.e. as a LOGICAL OR UNIVERSAL WHOLE.

H. But an ACCIDENTAL WHOLE (v.g. 'heap', 'white man', 'litter', 'family', 'state') TAKEN REALLY, may be:

a. either an AGGREGATE WHOLE, i.e. a whole whereof the unity is by juxta-position: such as a 'heap'.

b. or a CAUSAL WHOLE, i.e. a whole whereof the unity is on the score of cause: which cause may be:

b1. either intrinsic or formal: and then is had an INHERENTIAL WHOLE, such as 'white man', where the unity of the whole is through the inherence of whiteness in man as an (accidental) formal cause.

b2. or extrinsic: and then:

b2a. either efficient: as a 'litter' is a whole whose unity is on the score of efficient cause, inasmuch as the parts proceed from one agent.

b2b. or final: as 'family' or 'state', whose unity is on the score of final cause, inasmuch as the parts conspire to one end.

I. But an ACCIDENTAL WHOLE TAKEN LOGICALLY may be:

a. either an accidental whole universal to some substance diverse according to accident: as 'coloured man' is a universal whole whereof the inferiors or parts are 'white man', 'black man', 'yellow man'. etc.

b. or an accidental whole universal to some accident diverse according to subject: as 'white' is a universal whole whereof the inferiors or parts are 'milk', 'snow' etc.

c. or an accidental whole universal to some accident diverse according to another accident: as 'white' is a universal whole whereof the inferiors or parts are 'sweet white', 'bitter white' etc.

J. Accordingly the kinds of whole may be thus shown schematically:-

Something may be a WHOLE:
- either THROUGH ITSELF: which may be considered
  - either as a REAL WHOLE: which is
    - either an ESSENTIAL WHOLE: which is
      - either a PHYSICAL WHOLE.
      - or a METAPHYSICAL WHOLE.
    - or a NON-ESSENTIAL WHOLE: which is
      - either an ENTITATIVE WHOLE.
      - or a NON-ENTITATIVE WHOLE: and this is
        - either an INTEGRAL WHOLE.
        - or a POTESTATIVE WHOLE.
  - or as a LOGICAL or UNIVERSAL WHOLE: which is
    - either a UNIVOCAL WHOLE: which is
      - either a GENERIC WHOLE (genus).
      - or a SPECIFIC WHOLE (species).
    - or an ANALOGOUS WHOLE (analogue).
- or ACCIDENTALLY: which may be considered
  - either as a REAL WHOLE: which is
    - either an AGGREGATE WHOLE.
    - or a CAUSAL WHOLE: which is
      - either an INHERENTIAL WHOLE.
      - or a NON-INHERENTIAL WHOLE: which is
        - either a WHOLE by reason of AGENT.
        - or a WHOLE by reason of END.
  - or as a LOGICAL or UNIVERSAL WHOLE: which is
    - either of SUBSTANCES diverse according to accident.
    - or of ACCIDENTS: and then
      - either diverse according to substance or subject.
      - or diverse according to another accident.

……

ARTICLE TWO.

NATURE OF DIVISION.

187. NOTION OF DIVISION: In order to manifest what is confused in a thing which is to be defined, that thing must be distributed through its members, or, if it be question of some term, through its various significations. (Cf. John of St Thomas, Cursus Phil. I, p.21).

A. For division, like definition, manifests the parts of something:
a. but otherwise than does definition:

b. for whereas:
b1. definition manifests the parts in conjoining them,
b2. division manifests them in resolving them.

B. And division, like definition, tends towards a distinct concept:
a. but otherwise than does definition;
b. for division, by proposing the parts, as it were, gathers the matter from which definition is made. (cf. n.180).

C. Accordingly:
a. While DIVISION TAKEN COMMONLY is: DISTRIBUTION OF A WHOLE INTO ITS PARTS,
b. LOGICAL DIVISION (i.e. division taken as a "mode of knowing" or as an instrument of definition) is: DISCOURSE DISTRIBUTING SOME THING THROUGH ITS MEMBERS OR A TERM THROUGH ITS VARIOUS SIGNIFICATIONS.

188. FOUNDATION OF DIVISION: In every division are to be distinguished:

A. Besides:
a. The WHOLE, which is what is divided,
b. and the PARTS, which are the members into which the whole is divided:

B. Also the FOUNDATION of the division:
a. which is that by reason whereof (or on the score whereof) division is made.
b. Thus:
b1. if man is divided into white man, black man, yellow man etc.,
b2. the foundation of that division is colour.

....

ARTICLE THREE.

KINDS OF DIVISION.

189. NOMINAL AND REAL DIVISION: It is clear from what has been said (n.187), that there are two genera of division, according as the whole to be divided is either a thing or a name.

A. Division WHICH MANIFESTS THE SIGNIFICATIONS OF A VOCABLE is called NOMINAL division.

B. But division WHICH DISTRIBUTES A THING ITSELF INTO ITS PARTS is called REAL division. Here are some examples of real division:
a. 'division of animal into rational animal and irrational animal'.
b. 'division of man into white man and black man'.
c. 'division of man into soul and body'.

190. KINDS OF REAL DIVISION: Let us take the examples just given (n.189):

A. Of these examples:
a. The first and third distribute a whole ('animal' and 'man') into parts which are in the whole OF ITSELF (per se) or BY REASON OF ITS NATURE:
a1. for by reason of its own nature, animal contains beneath itself rational animal and irrational animal.
a2. and likewise by reason of his own nature, man contains within himself soul and body.
b. Such a division, WHICH DISTRIBUTES A WHOLE INTO PARTS WHICH BY REASON OF ITS OWN NATURE ARE IN IT, is called DIVISION 'PER SE' (or division through own nature).

B. But the second example has itself otherwise:

a. For 'white' and 'black':
a1. are not parts of the nature of man,
a2. but accidents of man.
b. Such a division, WHICH DISTRIBUTES A THING INTO PARTS WHICH ARE IN IT BY WAY OF ACCIDENT OR BY REASON OF OTHER, is called DIVISION 'PER ACCIDENS' or ACCIDENTAL DIVISION.

C. Wherefore:
a. Care must be taken not to confuse:
a1. division 'per se',
a2. with division of a whole 'per se':
b. For:
b1. also an accidental whole may be divided 'per se': as when:
b1a. 'white man' is divided into 'man' and 'whiteness';
b1b. or 'heap' is divided into 'this stone' and 'that stone'.
b2. and a whole 'per se' may be divided 'per accidens': as when:
b2a. 'man' (rational animal) is divided into 'man' (male) and woman;
b2b. or 'man' is divided into 'white man', 'black man', 'yellow man' etc.

D. Let us again consider the first example: 'division of animal into rational animal and irrational animal'; and also another example: 'division of being into substance and accident':
a. In both of these examples:
a1. the whole is a LOGICAL UNIVERSAL;
a2. and the parts are its INFERIORS, which are called SUBJECTIVE parts.
b. But:
b1. In the former example:
b1a. the whole is a UNIVOCAL WHOLE, containing its parts not actually, but potentially: wherefore it is called a UNIVOCAL or POTENTIAL WHOLE;
b1b. and the parts are called UNIVOCAL or POTENTIAL parts:
b1b1. and if the whole is a genus, then the parts are species;
b1b2. but if the whole is a species, then the parts are individuals.
b2. Whereas in the latter example:
b2a. the whole (being) is an ANALOGOUS WHOLE, containing its parts actually confusedly: wherefore it is called an ANALOGOUS WHOLE;
b2b. and the parts are called MODES.

E. But let us take the example: 'division of man into soul and body'; and also this other example: 'division of man into animal and rational':
a. In both these examples:
a1. the whole with reference to the parts into which it is divided:
a1a. is not a logical universal,
a1b. but is a real nature; and therefore thus taken is taken as a REAL whole;
a2. and the parts:
a2a. are not inferiors,
a2b. but are parts of a real nature.
b. However:
b1. In both these examples the whole is divided into parts which express its essence.
b2. wherefore such division is called ESSENTIAL DIVISION.
b3. Nevertheless these two examples do not have themselves in the same way:
b3a. For in the former example ('division of man into soul and body') the parts are REALLY DISTINCT ESSENTIAL PARTS: wherefore:
b3a1. such parts are called PHYSICAL ESSENTIAL PARTS;
b3a2. and such division is called PHYSICAL ESSENTIAL DIVISION.
b3b. But in the latter example ('division of man into animal and rational'), the parts are not really distinct essential parts, but are METAPHYSICAL DEGREES: wherefore:
b3b1. such parts are called METAPHYSICAL ESSENTIAL PARTS;
b3b2. and such division is called METAPHYSICAL ESSENTIAL DIVISION.

F. But:
a. Not every division of a real whole is a division into parts which express its essence.

b. Which is clear from these examples: 'division of actual man into essence and be': 'division of man into head, neck, trunk, arms and legs'; 'division of human soul into vegetative soul, sensitive soul, and intellective soul':

b1. For in these examples, the parts do not express the essence of man, nor of human soul.

b2. But the first example is a division into ENTITATIVE parts, i.e. into those members which constitute the BEING or ENTITY of actual man: wherefore such division is called ENTITATIVE DIVISION.

b3. And the second example is a division into INTEGRAL or QUANTITATIVE parts: wherefore it is called INTEGRAL DIVISION.

b4. And the third example is a division into degrees of power, which are called POTESTATIVE parts; wherefore such division is called POTESTATIVE DIVISION.

G. But ACCIDENTAL DIVISION:

a. Is always division of a logical or universal whole into its inferiors;

b. for division of an accidental real whole is either essential or integral division; and therefore is the same kind of division as that of a real whole which is through self a whole.

H. And indeed ACCIDENTAL DIVISION is:

a. either of a substance into inferiors according to diverse accidental differences: as when man is divided into white man, black man, yellow man etc:

b. or of an accident into inferiors: and then:

b1. either according to diverse substances or subjects: as when 'white' is divided into 'milk' and snow' etc;

b2. or according to diverse accidental differences: as when 'white' is divided into 'sweet white' and 'bitter white'.

I. Accordingly the diverse divisions may be thus schematically exhibited:-

DIVISION is
- either of a NAME: and then it is NOMINAL DIVISION.
- or of a THING: and then it is REAL DIVISION: which is
  - either 'PER SE': which is
    - either of a real whole: and then it is
      - either ESSENTIAL: which is
        - either PHYSICAL.
        - or METAPHYSICAL.
      - or NON-ESSENTIAL: which is
        - either ENTITATIVE.
        - or NON-ENTITATIVE: which is
          - either INTEGRAL.
          - or POTESTATIVE.
    - or of a LOGICAL or UNIVERSAL WHOLE: and then the division is into SUBJECTIVE PARTS: but logical or universal whole is
      - either UNIVOCAL: and then the division is UNIVOCAL, and into UNIVOCAL PARTS: but a univocal whole is
        - either GENUS, which is divided into species.
        - or SPECIES, which is divided into individuals.
      - or ANALOGOUS: and then the division is ANALOGOUS, and into ANALOGOUS PARTS, which are modes.
  - or ACCIDENTAL: and then is divided a logical or universal whole, which is
    - either a substance divided into inferiors through diverse accidental differences.
    - or an accident divided into inferiors: and then indeed
      - either according to diverse subjects or substances.
      - or according to diverse accidental differences.

……

ARTICLE FOUR.

LAWS OF DIVISION.

191. FIRST LAW: "Let all the dividing members together exhaust, or be adequate to, the divided whole: for in the whole there is not else than all the parts together." (John of St Thomas: Cursus Phil. I, p.21).

192. SECOND LAW: "Let the members singly taken be inferior to, that is, less than, the whole.

A. For a whole is greater than the part." (John of St Thomas, ibid.).

B. This law follows from the first law.

193. THIRD LAW: Let the dividing members be opposite.

A. This follows from the first law.

B. Hence:
a. let not one member be another,
b. nor include another in itself.

C. Therefore division is always to be made 'per sic et non', that is, through contradictories.

194. FOURTH LAW: In division:

A. Let those members be first assigned into which the dividend is immediately divided;

B. and if afterwards other divisors occur, let the members of the first division be subdivided singly.

C. This follows from the third law.

……

BOOK TWO.

....
....

...

SECOND PART OF LOGIC: ON PREDICATION.

....
....

...

195. CONNEXION WITH PRECEDING PART: Having dealt with those things which pertain to predicability, we come now to the question of predication itself, or of the manners in which predicables are actually attributed to subjects.

196. GENERAL VIEW OF THIS PART: However, since predication is made in judgment,

A. Before approaching predication itself, certain thing must be premised regarding:
a. judgment itself,
b. and its sign, or proposition.

B. This part of logic will accordingly be dealt with in two sections:

a. SECTION ONE will treat the pre-ambles to the study of predication: which are two, to wit:
a1. Judgment itself, which is the CAUSE of predication.
a2. The WORK of judgment and together its SIGN, which is the proposition or enunciation.

b. SECTION TWO will treat of predication itself.

C. Which may be thus exhibited schematically:-

On predication:
- PRE-AMBLES to the study of predication: (SECTION ONE)
  - On judgment, which is the CAUSE of predication.
  - On the WORK of judgment and together the SIGN of that work, which is the PROPOSITION:
    - Its nature:
      - Its definition.
      - Its division.
    - Its properties.
- On PREDICATION ITSELF: (SECTION TWO)
  - in signified act
    - Its nature.
    - Its species
      - Identical predication.
      - Formal predication
        - direct
          - PER SE: on the four modes.
          - PER ACCIDENS.
        - indirect.
  - in exercised act
    - Predication of the CONCRETE:
      - of the concrete.
      - of the abstract.
    - Predication of the ABSTRACT:
      - of the abstract.
      - of the concrete.

……

SECTION ONE.

……

PRE-AMBLES TO THE STUDY OF PREDICATION.

……

197. ORDER OF PROCEDURE: As indicated above, the pre-ambles to the study of predication:

A. Deal:

a. First, with judgment, which is the cause of predication.

b. Secondly, with the work of judgment, which is enunciation, and the sign thereof, which is proposition.

B. Hence the following order:-

Pre-ambles to the study of predication:
- On judgment..............................Chapter sixteen.
- On enunciation or proposition............Chapter seventeen.

……

CHAPTER SIXTEEN.

....

JUDGMENT, WHICH IS THE CAUSE OF PREDICATION.

....

198. ORDER OF PROCEDURE: The treatment of judgment:

A. Will expose:
a. First, its nature.
b. Secondly, its properties.

D. Hence the following order:-

On judgment, which is the cause of predication:
- Its nature........................Article one.
- Its properties....................Article two.

....

ARTICLE ONE.

NATURE OF JUDGMENT.

199. COMPARISON OF JUDGMENT WITH SIMPLE APPREHENSION: Something has been said already above regarding judgment and its diversity from simple apprehension (nn.15-17).

A. Simple apprehension:
a. even that whereby is obtained:
a1. a complex concept such as 'musician', (cf. n.49, A.b),
a2. or a composite understanding such as 'rational animal' (cf.n.161),
b. is never a perfect knowledge:
b1. (Note that we say 'perfect knowledge', not 'perfect concept'):
b2. For formally it is neither true nor false.

B. Truth and falsity of knowledge appear, when the intellect begins:
a. to affirm THAT WHICH IS or IS NOT, TO BE;
b. or to deny THAT WHICH IS NOT or IS, TO BE.

C. This:
a. affirmation is made by means of the verb 'IS': as in this example: 'Man IS mortal'.
b. negation is made by means of the verb 'IS NOT': as in this example: 'This boy IS NOT lazy'.

200. DEFINITION OF JUDGMENT: Accordingly:

A. "THE ACT OF INTELLECT WHEREBY IT COMPOSES OR DIVIDES BY AFFIRMING OR DENYING" is JUDGMENT (De Verit. q.14, a.1).

B. For judgment is an act of intellect, not of will, as was contended by Descartes (Discours de la Methode et Meditation 4), by Malebranche (Recherche de la Verite, I, ch.2; IV, ch.1), and by others.
a. For the object of judgment is to assert a relation between concepts and thing: which asserting results from comparison.
a1. Therefore the same is the object of judgment as of comparison.
a2. But comparison is an act of intellect, not of will.
b. But Descartes and all those who along with him admit that concepts are that which we know:
b1. make comparison of concepts with thing impossible;

b2. and therefore they are obliged to attribute judgment:
b2a. not to the intellect,
b2b. but to the will.
c. This question of the intellectualist or voluntarist nature of judgment is dealt with more fully in psychology.

C. Many modern writers deny that in every judgment there is composition of two concepts (they give such examples as these: 'Good', 'Well', 'Well-done', 'Bravo'). Moreover they deny that ideas or concepts precede judgment.

a. For:
a1. these authors:
a1a. either conceive judgment, as did Kant, as a subsumption of the intuitions of sensibility to the 'a priori' forms of the understanding,
a1b. or, along with Idealists, conceive judgment as a creation of mind.
a2. But these conceptions:
a2a. which indeed logically follow from the subjective tenets of Kantian philosophy or of the Idealists,
a2b. are not coherent with the realism of knowledge.

b. These modern writers:
b1. are more or less imbued with the principles of the Idealists,
b2. and especially they forget that intellect cannot affirm or deny some relation without previously apprehending the things between which is the relation to be affirmed, - as is shown at length in defensive metaphysics.

c. Therefore as to what concerns the composition and division, it is to be noted that "since the conceptions of the intellect are the similitudes of things, those things which pertain to the intellect can be considered and named in two ways: in one way according to themselves, in another way according to the characters of the things, whereof they are similitudes. Just as the image of Hercules according to itself indeed is said to be, and is, copper; but inasmuch as it is a similitude of Hercules, it is named a man.
c1. "Thus also, if we consider those things which pertain to the intellect according to themselves, there is always composition where there is truth and falsity; which is never found in the intellect, save through this that the intellect compares one simple concept to another.
c2. "But if it be referred to the thing, sometimes it is called composition, sometimes it is called division.
c2a. "Composition indeed when the intellect compares one concept to another, as apprehending the conjunction or identity of the THINGS whereof they are the conceptions;
c2b. "but division, when it so compares one concept to another, as to apprehend that the THINGS are diverse." (In I Perhiherm. lect.3, n.4).
c3. Which is thus well expressed by Maritain:
c3a. "Considering concepts in relation to the thing itself 'according to the characters of the things whereof they are the similitudes':
c3a1. "there is:
c3a1a. "composition 'when the intelligence compares one concept with another in such a manner as to grasp the conjunction or identity between the things which these concepts represent;
c3a1b. "'and division when the intelligence compares one concept with another in such a manner as to apprehend that these things are different.'
c3a2. "In this sense an affirmative enunciation is called 'composition' inasmuch as it signifies conjunction on the part of the thing, a negative enunciation, 'division', inasmuch as it signifies the separation of things, and the second operation of the mind is called 'composition and division'.
c3b. "But considering concepts according to themselves, as they are themselves in the mind, the intelligence always formulates its (affirmative or negative) enunciations by comparing and combining concepts. From this aspect, the second operation of the mind always involves composition." (Maritain: Introduction to Logic, p.83).

D. By the words "BY AFFIRMING OR DENYING" is indicated the FORM of judgment, which is ASSENT (affirmation) or DISSENT (negation).

a. For it is to be considered that SEVERAL ACTS concur to the forming of a judgment, - as is shown in psychology.

a1. To illustrate this, let us take the judgment: 'The clock is standing on the table'.

a1a. First, I apprehend 'the clock' and '(thing) standing on the table'. The apprehensions of these are SIMPLE APPREHENSIONS (the first operation of the mind (nn.16-18; 25-31).

a1b. Secondly, I compose these two, forming the mental enunciation, which is a MENTAL CONSTRUCT, to wit: 'the clock is (a thing) standing on the table'. In doing this, I IDENTIFY S (the clock) and P (thing standing on the table).

a1c. Thirdly, I compare this construct with the thing, enquiring whether IN THE THING there is identity between 'the clock' and '(a thing) standing on the table' as there is in the mental construct; that is, I enquire whether the two concepts, to wit, 'the clock' and 'a thing standing on the table' are each conformed with THE SAME THING.

a1d. Fourthly, I apprehend or perceive that each of these two concepts is conformed with THE SAME THING, thus apprehending that THE THING which I conceive as 'the clock' is THE SAME THING with THE THING which I conceive as 'a thing standing on the table'; in apprehending this, I apprehend also in exercised act the conformity of the MENTAL CONSTRUCT with THE THING, perceiving that there is identity in the thing between 'the clock' and 'a thing standing on the table' JUST AS there is identity in the mental construct.

a1e. Fifthly, I affirm (assert or assent to) this IDENTITY IN THE THING, thereby asserting also in exercised act the CONFORMITY of the mental construct with the thing. This last act is the VERY ACT OF JUDGMENT itself.

a2. It will be well here - borrowing from psychology - to explain these several acts further.

a2a. FIRST ACT: The first act or phase is the SIMPLE APPREHENSIONS whereby the intellect understands 'the clock' and '(thing) standing on the table), i.e. those realities which will be the S and P of the judgment.

a2a1. However, so far these are apprehended:

a2a1a. absolutely in themselves,

a2a1b. not as related to each other by way of S and P.

a2a2. Regarding this act of simple apprehensions enough has been said above (nn.16-18; 25-31).

a2b. SECOND ACT: The second act or phase is the COMPOSITION OR DIVISION of S and P, i.e. the act of setting up 'the clock' and 'thing standing on the table' in an enunciation AS SUBJECT AND PREDICATE.

a2b1. This act accordingly is terminated at a WORK or CONSTRUCT, to wit, a (mental) ENUNCIATION, which is not yet judged (i.e. not yet affirmed nor denied), - for the judgment, which is affirmation or denial, has not yet been exercised, - but TO BE JUDGED.

a2b2. This (mental) enunciation preceding judgment:

a2b2a. expresses merely a possible judgment, being a merely AFFIRMABLE OR DENIABLE PROPOSITION;

a2b2b. and therefore may be called a PROPOSITION TO BE JUDGED, or an ENUNCIATIVE PROPOSITION, or PROPOSITION SIGNIFIED;

a2b2c. and it has itself as the matter of the proposition formally taken or judicative proposition or proposition exercised which arises in the very act of judging.

a2b3. This enunciative proposition:

a2b3a. is:

a2b3a1. known in being constructed, for it is constructed by an act of knowledge, namely, by an act of comparative apprehension;

a2b3a2. and constructed in being known, for in it the S and P are brought together, i.e. composed;
a2b3b. and:
a2b3b1. consists of two concepts copulated as S and P:
a2b3b2. wherefore these are copulated by the verb 'is' (or 'is not'): which indeed:
a2b3b2a. as always, signifies existence (actual or possible),
a2b3b2b. but:
a2b3b2b1. not yet exercised existence,
a2b3b2b2. but only signified existence;
a2b3b2c. wherefore in this enunciative proposition the copula ('is' or 'is not'):
a2b3b2c1. exercises only a copulative office,
a2b3b2c2. and not yet a judicative office.

a2b4. The EXISTENCE of such proposition signified or enunciative proposition previous to judgment, is evident:

a2b4a. First indeed, 'a priori':
a2b4a1. For judgment is an assent (or dissent) of the intellect about something which is capable of being so judged;
a2b4a2. But only a complex truth signified by an enunciation is capable of being so judged.
a2b4a3. Therefore the act of judgment is distinct from, and presupposes, the construction of the enunciation.

a2b4b. Secondly, 'a posteriori':
a2b4b1. "When we make a doubtful enunciation, we see with particular clarity that the act of constructing an enunciation, in which we already combine and divide, is not the same as the act of judging. In formulating such a proposition we have materially combined two concepts; we have not yet judged (for on the contrary, we are withholding assent and taking care not to say 'this is so' or 'this is not so'." (Maritain: Introd. to Logic, p.86).
a2b4b2. Moreover, before we answer a question even mentally (i.e. before we judge), we have the question in mind: that is, we have in mind the enunciation to which we will assent or dissent; or, in other words, we have in mind the enunciation which we are about to judge.
a2b4b3. Generally too, before we affirm we must have enacted some process of discovery or 'invention': "It is by having before our mind a proposition that is already constructed, but as something 'to be judged' as 'invented', not as demonstrated (e.g. 'plants breathe?') that we can in a reasoning......compare the S and P with that which is, and judge that it is true: 'yes, plants breathe'." (Maritain, loc. cit. p.87).

a2b5. If many philosophers have failed to observe this distinction between this enunciative proposition which precedes the act of judging, and the judicative proposition which is constituted in the very act of judging, it is because the former is, so to speak, masked by the latter, since the judicative proposition is utterly similar to the enunciative proposition in regard to oral expression: for both of them are thus orally expressed: 'The clock is standing on the table'.

a2c. THIRD ACT: The third act or phase is the COMPARISON of S and P AS THEY ARE THING or AS THEY ARE IN THE REAL.

a2c1. This act consists in enquiring:
a2c1a. whether IN THING there is identity between 'the clock' and 'a thing standing on the table';
a2c1b. or, in other words, whether there is exercised IN THE REAL that identity which is signified in the mental construct or enunciative proposition;
a2c1c. or, again, whether the two concepts, to wit, 'the clock' and 'a thing standing on the table', which have been composed in the enunciative proposition, are each conformed with the same thing.

a2c2. This comparison or enquiry may be made:

a2c2a. either by a simple examination or analysis of the S and P, - as is the case when it is question of self-evident judgments, such as this: 'a whole is greater than its own part'.

a2c2b. or by means of sensible experience, - as is the case in the example given: 'the clock is standing on the table'.

a2c2c. or by a reasoning which resolves the enunciation in question into its principles, comparing the S and P by means of a middle term (M), - as is the case when it is question of demonstrated judgments, such as this: 'human soul is immortal', or this: 'the sum of the angles of a triangle is equal to two right angles'.

a2d. FOURTH ACT: The fourth act or phase is the PERCEPTION of the agreement (or disagreement) of S and P AS THEY ARE THING or AS THEY ARE IN THE REAL.

a2d1. By this act the intellect perceives:

a2d1a. that there is identity (or diversity) IN THING between 'the clock' and 'a thing standing on the table';

a2d1b. or, in other words, that there is exercised IN THE REAL that identity (or diversity) which is signified in the mental construct or enunciative proposition;

a2d1c. or again, that the two concepts, to wit, 'the clock' and 'a thing standing on the table', are each conformed with (or are not each conformed with) the same thing.

a2d2. This act, like all the preceding acts, is a simple apprehension, - not a judgment.

a2d2a. For by this act the identity (or diversity) in thing between S and P is CONCEIVED only, that is:

a2d2a1. known after the manner of a quiddity,

a2d2a2. or known in signified act;

a2d2b. Whereas in judgment or assent it is EXERCISED or known in exercised act.

a2e. FIFTH ACT: The fifth act or phase is the ASSENT (or DISSENT):

a2e1. whereby the identity (or diversity) in thing between S and P is attained AS EXERCISED.

a2e2. Which act is the very act of judgment itself, formally taken.

b. Wherefrom it follows that judgment, although materially multiplex, is formally an act one and simple.

b1. For:

b1a. One act is borne upon one object.

b1b. But the object of judgment:

b1b1. is not two or several ideas collected together,

b1b2. but the actual identity (or diversity) of S and P, - which is one and simple.

b2. As Maritain says: "It is evident.........that the judgment properly so-called is simple, that is to say, indivisible, not decomposable into parts. It consists in the act of 'composing' or 'dividing' only so far as this act is completed in the act of assent which formally constitutes the judgment, and wherein knowledge has its term in an 'ita est', 'this is so'." (Introd. to Logic. p.90).

c. NOTE that modern people often call assent by the name of 'belief', using this word in a wide sense: thus is it often said: 'I believe that two and two are four'.

c1. This wide use of the word 'belief' can be admitted provided all danger of confusion is removed between:

c1a. the assent of faith (of 'belief' properly so-called) which is made under the specificative influence of the will,

c1b. and scientific assent, which proceeds from the evidence of the object without the intervention of the will.

c2. For diversely, according to diverse objects whereupon judgment is borne, do the will and the affect of the mind exercise influence upon assent, as is explained elsewhere where it is question of science, faith and opinion.

....

ARTICLE TWO.

PROPERTIES OF JUDGMENT.

201. TWOFOLD PROPERTY OF JUDGMENT: Since judgment affirms to be or to be not IN THE THING that which is had in the mind, there is a TWOFOLD PROPERTY of judgment:

A. Either it affirms to be IN THE REAL that which is, or to be not that which is not: and then judgment is called TRUE.

a. Thus in this example: 'Sydney is in Australia', it is signified that the city which is Sydney is in the real in Australia.

b. And in this example: 'Sydney is not in China', it is signified that the city which is Sydney is not in the real in China.

B. Or it affirms to be IN THE REAL that which is not, or to be-not that which is: and then judgment is called FALSE.

a. Whereof let us take this example: 'Sydney is not in Australia'.

b. Or this example: 'Sydney is in China.'

....

CHAPTER SEVENTEEN.

THE SIGN OF JUDGMENT, WHICH IS THE PROPOSITION.

202. ORDER OF PROCEDURE: Just as simple apprehension has a WORK produced (concept), which is expressed or signified by a SIGN (oral or written term), so likewise judgment: whereof the WORK produced is the (mental) ENUNCIATION or PROPOSITION, of which SIGN is the (spoken or written) PROPOSITION.

A. Accordingly, this treatment of the sign of judgment will treat:

a. First, of the work produced by judgment, which work is the (mental) proposition or enunciation.

b. Secondly, of the sign of that work, which sign is the (oral or written) proposition: whereof will be treated:

b1. In the first place, its nature;
b2. In the second place, its division.
b3. In the third place, its properties.

B. Hence the following order:-

On the proposition
- as it is the WORK of judgment.......................Article one.
- as it is the SIGN of that work
  - Its nature.......................Article two.
  - Its division.....................Article three.
  - Its properties...................Article four.

....

Distinction between
Enunciation & Proposition

ARTICLE ONE.

THE WORK OF JUDGMENT, WHICH IS THE ENUNCIATION.

203. NATURE OF ENUNCIATION AS IT IS THE WORK OF JUDGMENT: As noted above:

A. Just as simple apprehension has a WORK which is the CONCEPT (nn.18, 32),
a. so also judgment has a WORK, which is the (mental) proposition or ENUNCIATION,
b. and which can also be called mental word. (Cf. Hugon: Cursus Phil. t.IV, p.137).

B. The MATTER of the enunciation are the things, or objective concepts, which are composed or divided: which are called the extremes.

C. But its FORM is the very composition or division, which is signified by the copula 'is' or 'is-not'.
a. The copula may signify materially only the composition or division, by merely copulating S and P without the intellect's assenting to this composition:
a1. This role of the verb is called its copulative role.
a2. And, as seen above (n.200, D. a2b3), such is the role of the verb in the mental enunciation or proposition signified or enunciative proposition before judgment.
b. But when the intellect vitally, exercisedly assents (or dissents):
b1. the verb exercises a truly judicative office,
b2. and the proposition or enunciation resulting is a JUDICATIVE PROPOSITION or PROPOSITION EXERCISED - which is the WORK of judgment.

D. Therefore:
a. Whereas the ENUNCIATIVE PROPOSITION or PROPOSITION SIGNIFIED (n.200, D.a2b2) is a work of a connotative or comparative apprehension,
b. The JUDICATIVE PROPOSITION or PROPOSITION EXERCISED is the work of JUDGMENT.

E. This work of judgment, which is the JUDICATIVE PROPOSITION, is produced IN THE VERY ACT OF JUDGING:
a. For judgment is an act of the intellect,
b. and the WORK of judgment is the VITAL composition or division of concepts wrought by the judgment, in the very judicative ASSENT.
c. Yet this work of the judgment is no more identified with the judgment (the act) than is the concept with apprehension.

……………………………………

ARTICLE TWO.

THE PROPOSITION, WHICH IS THE SIGN OF JUDGMENT.

204. PROPOSITION AS SIGN OF JUDGMENT: Proposition as it is the sign of judgment is distinguished from proposition as it is the work of judgment, just as the term is distinguished from the concept. (n.64).

A. For the work of judgment is the mental (judicative) proposition.

B. But the sign of judgment or of the work thereof is the oral or written (judicative) proposition.

C. It may be noted:
a. That in the rigour of language there is this difference between 'enunciation' and 'proposition':
a1. that the sign of judgment is strictly called 'enunciation' when it is not proposed as part of a reasoning; (cf. In Periherm. I, c.4, lect.7;

in Anal. Post. I, c.2, lect.5);

a2. but is strictly called 'proposition' when it is proposed as part of a reasoning.

b. But for practical purposes the two may be taken, and are taken, as of the same value. (Cf. John of St Thomas, Cursus Phil., Logica, Prima Part, Illus. q.5, a.1).

205. DEFINITION OF PROPOSITION: Therefore Proposition, as it is the SIGN of judgment: SPEECH SIGNIFYING BY ASSERTING THE TRUE OR THE FALSE - "ORATIO VERUM VEL FALSUM SIGNIFICANS INDICANDO".

A. THE MATTER of the proposition:
a. is constituted by:
a1. the SUBJECT (S),
a2. and the PREDICATE (P).
b. Which are called the extremes, inasmuch as they are to be composed.

B. The FORM of the proposition is the COPULA (IS) which conjoins the extremes.

……

ARTICLE THREE.

DIVISION OF PROPOSITIONS.

206. ORDER OF PROCEDURE: In exposing the division of propositions;

A. We shall expose first their essential division. (n.207).

B. Next, we shall expose their accidental divisions, i.e. their divisions on the score of something which is accidental to a proposition and does not constitute its essence: and indeed:
a. first, on the score of quality (n.208);
b. secondly, on the score of their quantity (n.209);
c. thirdly, on the score of their matter (n.210).

207. ESSENTIAL DIVISION: Let us take:

A. These examples:
a. 'Peter is scholarly'. Simple proposition ; ONE TRUTH
b. 'If his eye-lids flicker, he is alive'. Compound/Hypothetic proposition
c. 'Every being except God is contingent'.
d. 'The brave give their lives and the cowards make money'.
e. 'There must be one head or the public weal will suffer'.
f. 'God alone is eternal'.
g. 'Man, as an animal, is sentient'.

B. The propositions: 'Peter is scholarly' and 'If his eye-lids flicker, he is alive', differ in this, that:

a. The proposition 'Peter is scholarly', which "HAS A SUBJECT, VERBAL COPULA AND PREDICATE AS THE PRINCIPAL PARTS OF ITSELF", is called SIMPLE or CATEGORIC PROPOSITION.

b. On the other hand, the proposition: 'If his eye-lids flicker, he is alive', "WHICH HAS TWO CATEGORICAL (PROPOSITIONS) AS THE PRINCIPAL PARTS OF ITSELF", is called a COMPOUND OR HYPOTHETIC PROPOSITION.

c. "And thus hypothetic and categoric propositions differ according to COPULAS and according to the COPULATED EXTREMES:
c1. "because a hypothetic proposition unites:
c1a. "NOT BY A VERB,

c1b. "but by the particle 'AND' or 'IF' and such like;
c2. "and immediately it unites:
c2a. "not terms,
c2b. "but PROPOSITIONS." (John of St Thomas: Logica. I, c.7, p.25b).

d. But since in the hypothetic proposition, which unites propositions, there is a composition of copulas which are the form of propositions, this DIVISION ACCORDING TO COPULAS is an ESSENTIAL DIVISION.

C. In the example given of a hypothetic proposition:

a. The composition is EXPLICIT, i.e. the two partial propositions are expressed, and for that reason this proposition is called OPENLY COMPOUND.

b. But this composition from two partial propositions may be not explicit, as in this: 'Every being except God is contingent'.
b1. Such propositions WHICH MUST BE EXPLICATED BY SEVERAL PROPOSITIONS ARE CALLED OCCULTLY COMPOUND.
b2. And they receive the name also of EXPONIBLE PROPOSITIONS, i.e. propositions capable of explication through resolution into several propositions.

D. For this proposition: 'Every being except God is contingent', in spite of its appearance, is not categoric, but hypothetic:
a. For although openly it contains only one proposition,
b. nevertheless there are found OCCULTLY in it other propositions, which appear if it is unfolded or exposed.
c. For in it there are three propositions, as follows:
c1. 'Every being other than God is contingent'.
c2. 'God is a being'.
c3. 'God is not contingent'.

E. In the openly compound proposition: 'If his eye-lids flicker, he is alive', the partial propositions are copulated by the particle 'IF'.
a. This proposition WHOSE PARTS ARE COPULATED BY THE PARTICLE 'IF', is called a CONDITIONAL PROPOSITION.
b. But there are other ways of copulating propositions:
b1. The proposition: 'The brave give their lives and the cowards make money', in which THE TWO PARTS ARE COPULATED BY THE PARTICLE 'AND', is called a COPULATIVE PROPOSITION.
b2. But the proposition: 'There must be one head or the public weal will suffer', in which the PARTICLE IS 'OR', is called a DISJUNCTIVE PROPOSITION.

F. Similarly the occultly compound proposition is threefold:
a. The proposition 'Every being except God is contingent', WHICH IS AFFECTED BY THE PARTICLE 'EXCEPT', is called an EXCEPTIVE PROPOSITION.
b. The proposition 'God alone is eternal', WHICH IS AFFECTED BY THE PARTICLE 'ALONE' (or 'ONLY'), is called an EXCLUSIVE PROPOSITION.
c. The proposition 'Man, as an animal, is sentient', WHICH IS AFFECTED BY THE PARTICLE 'AS' (INASMUCH AS, IN SO FAR AS, FOR AS MUCH AS), is called a REDUPLICATIVE PROPOSITION.

G. THE LAWS OF HYPOTHETIC OR COMPOUND PROPOSITIONS are as follows:-

a. LAWS OF OPENLY HYPOTHETIC PROPOSITIONS: These laws are based on the nature of these propositions, which express one truth, to wit, the truth of the whole. Wherefore the laws are diverse according to the nature of the copula.

a1. LAW OF THE COPULATIVE PROPOSITION: EACH PART MUST BE TRUE.
a1a. Because the copula 'and' means that the truth of the whole is the sum of the truth of the members.
a1b. Therefore this proposition: 'The moon is moved, and the earth is not moved', is false.
a1c. Accordingly:
a1c1. from the truth of the whole follows the truth of each part;
a1c2. but not from the falsity of the whole follows the falsity of each part.

[illegible] works
[illegible] SIMPLE PROPOSITION

a2. LAW OF THE DISJUNCTIVE PROPOSITION: IT SUFFICES THAT ONE PART BE TRUE.

a2a. Because the copula 'or' opposes the parts in truth and falsity

a2b. Therefore this proposition: "Good is to be done and evil shunned, or two and two are not four' is true.

a2c. Accordingly:

a2c1. From the truth of a part, follows the truth of the whole;

a2c2. and if one part of a true disjunctive be denied, the other must be affirmed.

a3. LAW OF THE CONDITIONAL PROPOSITION: GOOD CONSEQUENCE SUFFICES.

a3a. The reason of this rule:

a3a1. Is not that the conditional proposition would affirm only the truth of the 'nexus', as some say (v.g. Remer; Logica Minor, ed. 1921, p.60), who reduce this proposition to a simple proposition;

a3a2. But:

a3a2a. is because the conditional proposition "affirms something to be true from a supposition";

a3a2b. nor ought this proposition be reduced to an argumentation (as Gredt reduces it: Logica Formalis, p.43):

a3a2b1. an argumentation (at least implicit) is indeed necessary to know the truth of the 'nexus',

a3a2b2. but this does not pertain to the essence of the proposition

a3b. Therefore:

a3b1. this proposition 'If twenty is an odd number it is not divisible by two' is true.

a3b2. on the other hand, this proposition 'If Australia is an island, five and five are ten' is false; because the former part is not the condition of the latter: for the proposition 'five and five are ten' is true:

a3b2a. ABSOLUTELY,

a3b2b. NOT FROM A CONDITION.

b. LAWS OF OCCUPTLY HYPOTHETIC PROPOSITIONS: These are as follows:-

b1. AN EXCLUSIVE PROPOSITION:

b1a. is resolved into a copulative proposition whereof:

b1a1. one part affirms that P agrees with S (this is the prejacent proposition: 'God is eternal'):

b1a2. and the other part denies that P agrees with other subjects ('Everything which is not God is not eternal').

b1b. Thus the proposition 'God alone is eternal' is resolved into this copulative proposition: 'God is eternal and no non-God is eternal'.

b2. AN EXCEPTIVE PROPOSITION is resolved into three categoric propositions taken copulatively:

b2a. One universal affirmative proposition, in which the term from which the exception is made is predicated of the exceptive part (God is a being).

b2b. A negative proposition in which P is denied of the excepted part (God is not contingent).

b2c. An affirmative proposition: (All beings other than God are contingent).

b3. A REDUPLICATIVE PROPOSITION:

b3a. Is resolved into two categoric propositions.

b3b. Thus the proposition: 'Man, as an animal, is sentient', is resolved into these two propositions:

b3b1. 'Man is sentient'.

b3b2. 'The reason why man is sentient is that he is an animal'.

208. DIVISION ON THE SCORE OF QUALITY: SIMPLE PROPOSITION Propositions are divided both on the score of the quality OF THE COPULA, and on the score of the quality OF THE PREDICATION.

A. ON THE SCORE OF THE QUALITY OF THE COPULA propositions are divided into:

a. AFFIRMATIVE propositions: v.g. 'Peter is truthful'.

b. and NEGATIVE propositions: v.g. 'Peter is not a liar'.

B. BUT ON THE SCORE OF THE QUALITY OF THE PREDICATION propositions are divided into:

a. Simply ATTRIBUTIVE propositions, which enunciate only that P is-in or is-not-in S.

a1. Wherefore these propositions are called propositions OF IN-BE (propositiones de inesse).

a2. As examples take these:

a2a. 'Man is an animal'.

a2b. 'Peter is avaricious'.

a2c. 'Peter is not a liar'.

b. MODAL propositions:

b1. Which enunciate:

b1a. not only that P is-in or is-not-in S.

b1b. but also that MODE in which P is-in or is-not-in S.

b2. As examples of modal propositions, let us take these:

b2a. 'It is possible that Peter be ill'.

b2b. 'It is impossible that Peter be an angel'.

b2c. 'It is contingent that Peter be in good health'.

b2d. 'It is necessary that Peter be mortal'.

b3. In a modal proposition TWO ELEMENTS are to be distinguished, to wit, the 'dictum' and the mode.

b3a. The 'DICTUM' is that part which enunciates the composition of P with S. Thus, in the proposition 'It is necessary that Peter be mortal', the 'dictum' is 'Peter be (is) mortal'.

b3b. The MODE is that part which determines the mode or manner of this composition of P (mortal) with S (Peter). Thus, in the proposition 'It is necessary that Peter be mortal', the mode is 'It is necessary'.

b4. "Because modal proposition is named from 'mode', in order to know what is a modal proposition:

b4a. "it is necessary previously to know what is a mode. But it is a determination affecting a thing (determinatio adiacens rei), which indeed happens:

b4a1. "through the adjection of an adjective, which determines a substantive, as when it is said 'the man is white',

b4a2. "or through an adverb, which determines a verb, as 'the man is running well'.

b4b. "It is to be known also that mode is threefold.

b4b1. "A certain mode determines the subject of a proposition, as 'a white man is running'.

b4b2. "A certain mode determines the predicate, as 'Socrates is a white man' or 'Socrates is running swiftly'.

b4b3. "A certain mode determines THE VERY COMPOSITION ITSELF OF THE PREDICATE WITH THE SUBJECT, as when it is said 'that Socrates run is impossible'; and FROM THIS MODE ALONE IS A PROPOSITION CALLED MODAL.

b4c. "But other propositions, which are not modal, are called (propositions) of in-be.

b4d. "But the modes which determine the composition are six, to wit:

b4d1. "true,

b4d2. "false,

b4d3. "necessary,

b4d4. "impossible,

b4d5. "possible,

b4d6. "contingent.

b4e. "But:

b4e1. "true and false add nothing over the significations of propositions of in-be; for the same is signified when it is said:

b4e1a. "'Socrates is not running' and 'that Socrates be running is false',

b4e1b. "and 'Socrates is running' and 'that Socrates be running is true'.

b4e2. "Which is not the case with the other four modes, because not the same is signified, when it is said:
b4e2a. "'Socrates is running',
b4e2b. "and 'that Socrates be running is possible'." (St Thomas: De Propos. Modal).

b5. Wherefore:
b5a. There are four modes which render a proposition modal, to wit:
b5a1. Necessary,
b5a2. Impossible,
b5a3. Possible.
b5a4. Contingent.
b5b. Of which two affect only propositions which ARE NOT in NECESSARY matter, to wit:
b5b1. possible,
b5b2. and contingent,
b5c. And of which two affect propositions which ARE in NECESSARY matter, to wit:
b5c1. necessary,
b5c2. and impossible.

b6. KANT makes another division:
b6a. For he - according to the tenets of his subjectivism - :
b6a1. speaks rather of "modalities of judgment" than of modes of proposition, since he is dealing with the subjective possibility or necessity of the act of judging, - not of the possibility or necessity of the relation expressed by the judgment or proposition, as does a philosophy of realism.
b6a2. And Kant distinguishes three modalities of judgment, to wit:
b6a2a. The mode of reality, proper to assertory judgments;
b6a2b. The mode of contingence, proper to problematic judgments;
b6a2c. The mode of necessity, proper to apodictic judgments.
b6b. Which division IS TO BE REJECTED:
b6b1. Not only because assertory propositions are not modal, but are simply attributive, - in which case the quarrel would be about words only;
b6b2. But also - and chiefly - because Kant's division is based upon a pseudo-problem arising from the tenets of his subjectivism, which beget for him the necessity of distinguishing possibility and necessity:
b6b2a. not as modes of reality,
b6b2b. but as modes of judging.

209. DIVISION ON THE SCORE OF QUANTITY: The quantity of a proposition is the property possessed by a proposition of communicating the P to a greater or less multitude of individuals in attributing it to S.

Therefore this division of propositions is taken from the quantity of S.

a. Wherefore it corresponds to the division of concepts on the score of their extension (n.50), and therefore is had the following division of propositions:

Proposition
- INDEFINITE: v.g. 'Man is bloodthirsty'.
- FINITE
  - COMMON
    - UNIVERSAL: v.g. 'Every man is mortal'.
    - PARTICULAR: v.g. 'Some man is mortal'.
  - SINGULAR: v.g. 'This man is guilty'.

a1. Therefore there is no need to delay upon this division.
a2. In logic the indefinite proposition (i.e. the proposition whose subject lacks any sign manifestative of its quantity, such as 'every' or 'some' or 'this') must be taken for universal or particular or singular as it is in reality: thus:

a2a. the proposition 'man is bloodthirsty' ought to be taken as particular.

a2b. the proposition 'man is mortal' ought to be taken as universal.

a2c. the proposition 'man, dying, redeemed the whole race of men', ought to be taken as singular (of Christ).

b. LACHELIER, it may however be noted, proposes a division of propositions into particular, partially collective, universal and collective. (Etudes sur le Syllogisme, pp.46ss).

b1. For:

b1a. He distinguishes "propositions such as 'every man is mortal' from propositions such as 'all the members of this family are learned', or 'all the apostles were present at the Last Supper'.

b1a1. "He calls the former universals, because they bear immediately upon a nature concerning which they state a law, and bear only mediately upon the individuals having this nature;

b1a2. "he calls the latter collective, because they bear immediately upon a collection of individuals, and express a simple fact.

b1b. "He distinguishes similarly between propositions such as 'some men are sincere' and propositions such as 'some members of this family are learned'.

b1b1. "He calls the first propositions particular, because they bear upon a nature, restricted this time, indeed, in extension, and because they imply a sense of right as well as a fact (human nature is not exclusive of sincerity).

b1b2. "He calls the second partially collective because they treat of a mere collection of individuals taken partially, and express nothing more than a fact." (Maritain: Introd. to Logic, pp.117-118).

b2. To which it is to be ANSWERED:

b2a. "In truth, propositions such as 'all the apostles were present at the Last Supper' and 'some members of this family are learned' are not collective propositions; only a proposition whose subject is taken collectively (in other words, has a 'suppositio copulata')" - cf. n.70.E. - "in relation to the Pr. is a collective proposition. E.g. 'the apostles were twelve',..................Therefore Mr. Lachelier's terminology must be rejected.

b2b. "A universal proposition such as 'Every man is mortal' has a double signification: it bears first and immediately upon the universal nature man taken in all its universality, and mediately upon the separate individuals taken one by one who possess this nature. Thus a proposition such as 'some man is sincere' bears primarily and immediately upon the universal nature man taken in a certain indeterminate individual (individuum vagum), and mediately and secondarily upon such and such an individual having this nature.

b2c. "Now let us consider propositions such as 'all men are mortal', 'some men are sincere'; they also have a double signification, but in the inverse order; they start with the individuals and proceed thence to the nature. Although these propositions (universal, in the first case, particular in the second) are used in everyday language, for the logician, from the strict point of view of the art of reasoning, they are incorrectly formulated. For reasoning is essentially concerned with the universal nature communicable to individuals, and it is this nature that must be emphasised in a correct formulation. In the language of Logic.......... universal propositions should be expressed by: 'Every......is.......' and not by 'all.......are.......', and particulars by: 'some.......is.....' not 'some........are........'.

b2d. "Finally, propositions such as those which Mr. Lachelier considers (all the apostles were at the Last Supper, some members of this family are learned), belong to the same type as those preceding (the first universal, the second particular), but by reason of their matter bear only upon a collection or series of individuals (taken divisively as Mr. Lachelier does not see), and are in the same act limited to the simple expression of a fact.

b2e. "However, Mr. Lachelier is quite right in saying that if a universal does nothing but signify a fact, without telling anything about a nature, then it cannot be used as a true Major in a syllogism of the first figure......." (Maritain: loc. cit. pp.118-119).

210. DIVISION ON THE SCORE OF MATTER: On this score propositions are divided into necessary, contingent and impossible.

A. For the MATTER of a proposition is its terms, inasmuch as they are considered according to their relation to each other.

B. But the matter of a proposition is threefold, to wit:
a. If P necessarily befits S, the matter is NATURAL or NECESSARY, as in the proposition 'man is an animal'.
b. If P only contingently befits S, the matter is CONTINGENT, as in the proposition 'the man is a carpenter'.
c. If P is repugnant to S, the matter is REMOVED or IMPOSSIBLE, as in the proposition 'man is an angel'.

C. Accordingly:
a. The proposition 'man is an animal', WHICH ENUNCIATES SOMETHING WHICH CANNOT BE OTHERWISE, is called a NECESSARY PROPOSITION or PROPOSITION IN NECESSARY MATTER.
b. The proposition 'the man is a carpenter', WHICH ENUNCIATES SOMETHING WHICH CAN BE OTHERWISE, is called a CONTINGENT PROPOSITION or PROPOSITION IN CONTINGENT MATTER.
c. The proposition 'man is an angel', WHICH ENUNCIATES SOMETHING WHICH CANNOT BE, is called an IMPOSSIBLE PROPOSITION or PROPOSITION IN IMPOSSIBLE MATTER.

D. Therefore:
a. In NECESSARY matter:
a1. Every affirmative proposition is necessary,
a2. While every negative proposition is impossible.
b. In IMPOSSIBLE matter:
b1. Every affirmative proposition is impossible,
b2. While every negative proposition is necessary.
c. In CONTINGENT matter: both affirmative and negative propositions are contingent.

211. SCHEMATIC SUMMARY: Accordingly, the division of propositions may be thus schematically exhibited:-

Propositions are divided:

- ESSENTIALLY (by reason of copula)
  - into CATEGORIC (or SIMPLE)
  - and HYPOTHETIC
    - openly
      - COPULATIVE.
      - DISJUNCTIVE.
      - CONDITIONAL.
    - occultly
      - EXCEPTIVE.
      - EXCLUSIVE.
      - REDUPLICATIVE.
- ACCIDENTALLY
  - by reason of matter
    - NECESSARY.
    - CONTINGENT.
    - IMPOSSIBLE.
  - by reason of some accident,
    - to wit, of the quality
      - of the copula
        - AFFIRMATIVE.
        - NEGATIVE.
      - of the predication
        - SIMPLY ATTRIBUTIVE.
        - MODAL
          - in necessary matter
            - NECESSARY.
            - IMPOSSIBLE.
          - in non-necessary matter
            - CONTINGENT.
            - POSSIBLE.
    - to wit, of the quantity
      - INDEFINITE.
      - FINITE
        - SINGULAR.
        - COMMON
          - UNIVERSAL.
          - PARTICULAR.

……………………………………

ARTICLE FOUR.

PROPERTIES OF PROPOSITIONS.

212. ORDER OF PROCEDURE: Since the properties of propositions are four:

A. To wit:
a. Identity;
b. Opposition;
c. Equipollence;
d. and conversion;

B. These properties will be dealt with in turn.

C. Hence the following order:-

On the properties of propositions:		
	Identity	Dissertation one.
	Opposition	Dissertation two.
	Equipollence	Dissertation three.
	Conversion	Dissertation four.

……

DISSERTATION ONE.

IDENTITY OF PROPOSITIONS.

213. NOTION AND DIVISION OF IDENTITY OF PROPOSITIONS: Concerning these it is sufficient to observe:

A. That the identity of propositions is the property by virtue whereof two or more propositions express THE SAME TRUTH.

B. The identity of propositions is twofold, to wit:
a. EXPLICIT identity which is had according as several propositions express by diverse terms the same truth with THE SAME CONCEPTS: as an example, take these two propositions:
a1. 'Homo est mortalis';
a2. 'Man is mortal'.
b. IMPLICIT identity, which is had according as several propositions express the same truth by diverse terms and DIVERSE CONCEPTS:
b1. As an example, let us take these two propositions:
b1a. 'Man is mortal';
b1b. 'Rational animal is mortal'.
b2. In these examples the subjects differ conceptually: for in the latter, the subject is the definition which, manifesting the subject of the former example (the defined: 'man'), expresses it in a more distinct way.

C. Which may be thus summarized:
a. There is IDENTITY of propositions provided they express THE SAME TRUTH, - even though they express it by diverse terms and even diverse concepts.
b. And indeed:
b1. if they express it by diverse terms but the same concepts, then the identity is EXPLICIT;
b2. but if they express it by diverse terms and also diverse concepts, then the identity is IMPLICIT only.
c. Which may be thus shown schematically:-

	IDENTITY of propositions	
	EXPLICIT	IMPLICIT
Terms	Diverse	Diverse
Concepts	SAME	Diverse
Truth	SAME	SAME

214. CONDITIONS REQUIRED FOR SAMENESS OF TRUTH, OR FOR IDENTITY, AT LEAST IMPLICIT, OF PROPOSITIONS: In order, therefore, that we may be able to diagnose which propositions are identical, at least implicitly, it is necessary to know the conditions required for identity of TRUTH.

These conditions are two, to wit:

a. The SUBJECTS of the propositions must be FORMALLY, even though implicitly only, THE SAME.
a1. And they are indeed FORMALLY THE SAME provided they do not differ by a distinction greater than that which is between the implicit and the explicit, or in other words, provided they do not differ by a distinction greater than a minor based mental distinction, or again in other words, provided they do not differ more than according to formal precision. (Cf. nn.110-111).
a2. Thus, for example:
a2a. Identical are the truths expressed by these two propositions, and consequently (implicitly) identical are these two propositions:
a2a1. 'Man is mortal'.
a2a2. 'Rational animal is mortal'.
a2b. But not identical are the truths expressed by these two propositions, and consequently not identical are these two propositions: 'Man is mortal' and 'animal is mortal';
a2b1. Because 'man' and 'animal' are NOT FORMALLY, but ONLY VIRTUALLY the same subjects:
a2b2. And indeed:
a2b2a. NOT FORMALLY THE SAME subjects, because they differ by a distinction greater than that which lies between the implicit and the explicit;
a2b2b. but VIRTUALLY THE SAME subjects, because there is inference (by a genuinely illative syllogism) from one to the other, inasmuch as it follows that if one (animal) receives a certain predicate (v.g. 'mortal'), then the other also receives it.

b. The PREDICATES of the propositions must be FORMALLY, even though implicitly only, THE SAME.
b1. Thus identical are the truths expressed by these two propositions, and consequently (implicitly) identical are these two propositions:
b1a. 'Peter is a man';
b1b. 'Peter is a rational animal'.
b2. But not identical are the truths expressed by these two propositions, and consequently not identical are these two propositions:
b2a. 'Peter is a man';
b2b. 'Peter is an animal'.

215. SOME EXAMPLES: It will be helpful here to give some examples both of identical propositions and of diverse propositions.

A. EXAMPLES OF (IMPLICITLY) IDENTICAL PROPOSITIONS:

a. First example:
a1. "The Father and I are one." (John 10.30).
'The Father and the Son are consubstantial'.
a2. For to be one and to be consubstantial signify the same: they differ only according to implicit and explicit.

b. Second example:
'The Virgin Mary is the mother of Jesus Christ.'
'The Virgin Mary is the mother of God'.
b2. For Jesus Christ and God are as defined and definition, differing therefore only according to implicit and explicit.

c. Third example:
'Christ is perfect God and perfect man'.
'Christ has a divine nature and a human nature, a divine will and a human will, a divine operation and a human operation, and a divine knowledge and a human knowledge'.
c2. For here the predicates likewise differ only as defined and definition, and accordingly only according to implicit and explicit.

B. EXAMPLE OF DIVERSE PROPOSITIONS:

a. These propositions: 'God is good'.
'God is just'.
'God is merciful'.
b. Are not identical, because these predicates are only VIRTUALLY identical, since:
b1. one cannot be inferred from another by a merely explicative syllogism,
b2. but a truly illative syllogism is required.

....

DISSERTATION TWO.

OPPOSITION OF PROPOSITIONS.

216. LOGICAL OPPOSITION: Whereas:

A. The opposition OF CONCEPTS - which is the same as the opposition OF THINGS, wherefore it is called PHYSICAL opposition - has been dealt with earlier (nn.57-58).

B. Here is to be treated LOGICAL opposition or the opposition OF PROPOSITIONS, which is THE PROPERTY OF PROPOSITIONS BY VIRTUE WHEREOF THERE IS HAD AFFIRMATION AND NEGATION OF THE SAME ABOUT THE SAME.

217. GENERAL RULE OF OPPOSITION: Since the opposition of propositions is affirmation and negation of the same about the same:

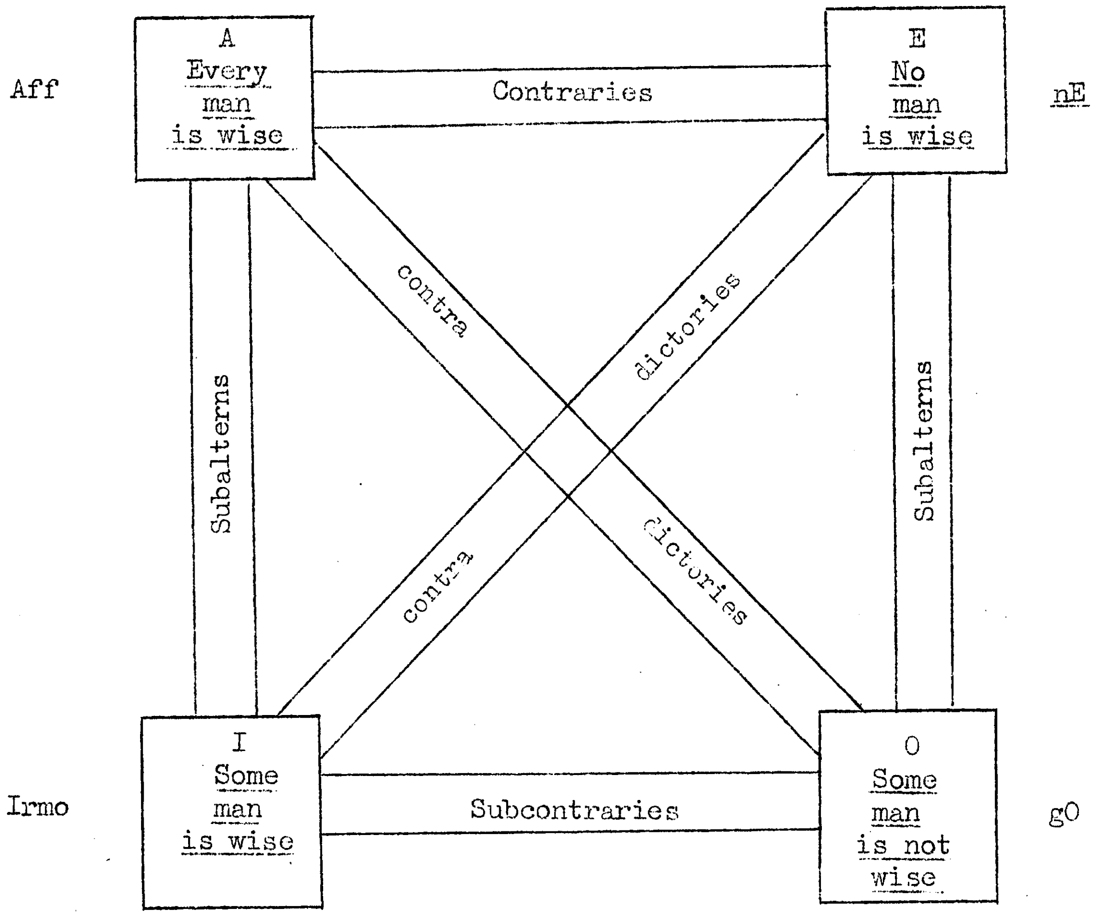
A. It is required for opposition of propositions that P and S remain the same:
a. according to the same signification,
b. and according to the same genus (not species) of supposition.

B. But the genera of supposition are:
a. material,
b. formal,
c. simple,
d. and personal. (cf. n.70).

C. Therefore, for example, the proposition 'man is a species'
- where 'man' has simple supposition:
a. is not contradicted by the proposition 'no man is a species'
- where 'man' has personal supposition;
b. but is contradicted by the proposition 'man is not a species'
- where 'man' retains simple supposition.

218. DIVERSE SPECIES OF OPPOSITION: The understanding of the diverse species of opposition of propositions will be helped by means of the figure known as 'the square of opposition'.

A. The 'square of opposition' is this:



B. For the understanding of this figure, note:

a. That of the same subject and predicate:
a1. six propositions can be formed, and six only, to wit:
a1a. universal affirmative,
a1b. universal negative;
a1c. particular affirmative,
a1d. particular negative;
a1e. singular affirmative,
a1f. singular negative.
a2. In the above schematic figure, singular propositions are not indicated, since in regard to oppositions they are assimilated to particulars.

b. The capital letters A, E, I and O (which are vowels from the words 'affirmo' and 'negro') are used to designate the diverse propositions, thus:
b1. A designates the universal affirmative;
b2. E designates the universal negative;
b3. I designates the particular affirmative;
b4. O designates the particular negative.

c. But from the four propositions which have the same S and P, there can be only six combinations, as thus illustrated:-

AE	Every man is wise	No man is wise.
AI	Every man is wise	Some man is wise.
AO	Every man is wise	Some man is not wise.
EI	No man is wise	Some man is wise.
EO	No man is wise	Some man is not wise.
IO	Some man is wise	Some man is not wise.

C. But OBSERVE that:
a. Neither AI nor EO are properly opposites, since they are not opposed according to affirmation and negation.
b. Therefore there remain only four OPPOSITE combinations.

D. The propositions AO and EI are opposed in the same way, to wit, NOT ONLY IN QUALITY BUT ALSO IN QUANTITY.

a. Therefore the propositions AO and EI have the same opposition between them. This opposition is called CONTRADICTORY.

b. CONTRADICTORY are PROPOSITIONS WHICH ARE REPUGNANT IN TRUTH AND IN FALSITY, SO THAT THEY CANNOT BE TRUE TOGETHER NOR FALSE TOGETHER.
b1. For A (or E) says that P agrees (or does not agree) universally with S.
b2. Wherefore the same P cannot together disagree (or not disagree) particularly with a S contained under the universal.
b3. And vice versa, what agrees (or does not agree) with some particular S cannot together disagree (or not disagree) with the universal S under which the particular S is contained.

c. Therefore in contradictories:
c1. From the truth of the one proposition, necessarily follows the falsity of the other;
c2. And from the falsity of the one proposition, necessarily follows the truth of the other.

E. But it is otherwise with AE and IO.

a. They are opposed indeed in quality, but NOT IN QUANTITY:
a1. In AE both are universal;
a2. In IO both are particular.

b. However in AE the opposition in quality is universal, but in IO it is particular. AE accordingly are called CONTRARIES, while IO are called SUBCONTRARIES.
b1. CONTRARY are PROPOSITIONS WHICH ARE REPUGNANT ONLY IN TRUTH, SO THAT TWO CONTRARY PROPOSITIONS CANNOT BE TOGETHER TRUE, BUT CAN BE TOGETHER FALSE.
b1a. That they cannot be together true is clear from this, that the same P cannot together be affirmed and denied universally of the same S.
b1b. Yet they can be together false, because each proposition affirms or denies universally, while the truth may lie in a particular affirmation or negation (in contingent matter). Thus false together are these two propositions:
b1b1. 'Every man is wise';
b1b2. 'No man is wise'.
b1c. Therefore:
b1c1. From the truth of one proposition can be concluded the falsity of the other;
b1c2. But not from the falsity of one can be concluded the truth of the other.
b2. SUBCONTRARY are PROPOSITIONS WHICH ARE REPUGNANT IN FALSITY BUT NOT IN TRUTH, SO THAT THEY CAN BE TOGETHER TRUE BUT NOT TOGETHER FALSE.
b2a. For:
b2a1. if one is false, its contradictory (which is universal) is true, and therefore the particular contained thereunder is true;
b2a2. therefore they cannot be together false.
b2b. On the other hand:
b2b1. If one true particular proposition is in CONTINGENT matter, the other (opposite) particular proposition can be together true.

b2b2. But this is not so in NECESSARY matter: for then the true particular proposition is contained under a true universal, which is the contradictory of the other particular proposition: which accordingly is necessarily false.

c. Although the propositions AI and EO, which are called SUBALTERN, are not properly opposite, since they are of the same quality, the following may be noted regarding them:

c1. IN NECESSARY MATTER they are together true or together false,

c1a. For whatever is true of the universal is true of the particular contained beneath it;

c1b. And whatever is false of the universal is false of the particular contained beneath it.

c2. IN CONTINGENT MATTER:

c2a. If the universal is true, the particular contained beneath it is true likewise, for the same reason.

c2b. But if the universal is false, it does not follow that the particular contained beneath it is false.

c3. Therefore:

c3a. it follows:

c3a1. that if the universal is true, the particular contained beneath it is true;

c3a2. that if the particular is false, the universal which contains it is false.

c3b. But:

c3b1. it does not follow that if the universal is false, the particular contained beneath it is false;

c3b2. nor does it follow that if the particular is true, the universal which contains it is true.

F. PARTICULAR RULES:

a. AS REGARDS INDEFINITE PROPOSITIONS:

a1. Contradiction is made by the simple negation of the copula, (unless, by a distributive particle, such as 'every' or 'some', the genus of supposition be changed);

a2. For:

a2a. The proposition 'man is avaricious' has as its contradictory 'man is NOT avaricious'.

a2b. But:

a2b1. The proposition 'every man is avaricious' has as its contradictory 'some man is not avaricious' (not 'every man is not avaricious' which is the contrary, being equivalent to this: 'no man is avaricious');

a2b2. The proposition 'some man is avaricious' has as its contradictory 'no man is avaricious' (not 'some man is not avaricious', which is its sub-contrary).

b. AS REGARDS A SINGULAR PROPOSITION - which has not opposition properly so-called save with its contradictory:

b1. Contradiction is made by the simple negation of the copula.

b2. Thus the proposition 'Peter is avaricious' has as its contradictory 'Peter IS NOT avaricious'.

c. AS REGARDS MODAL PROPOSITIONS oppositions are effected by negation of the mode and by change of the quantity of the 'dictum'.

c1. The signaletic letters of the modes are as follows:

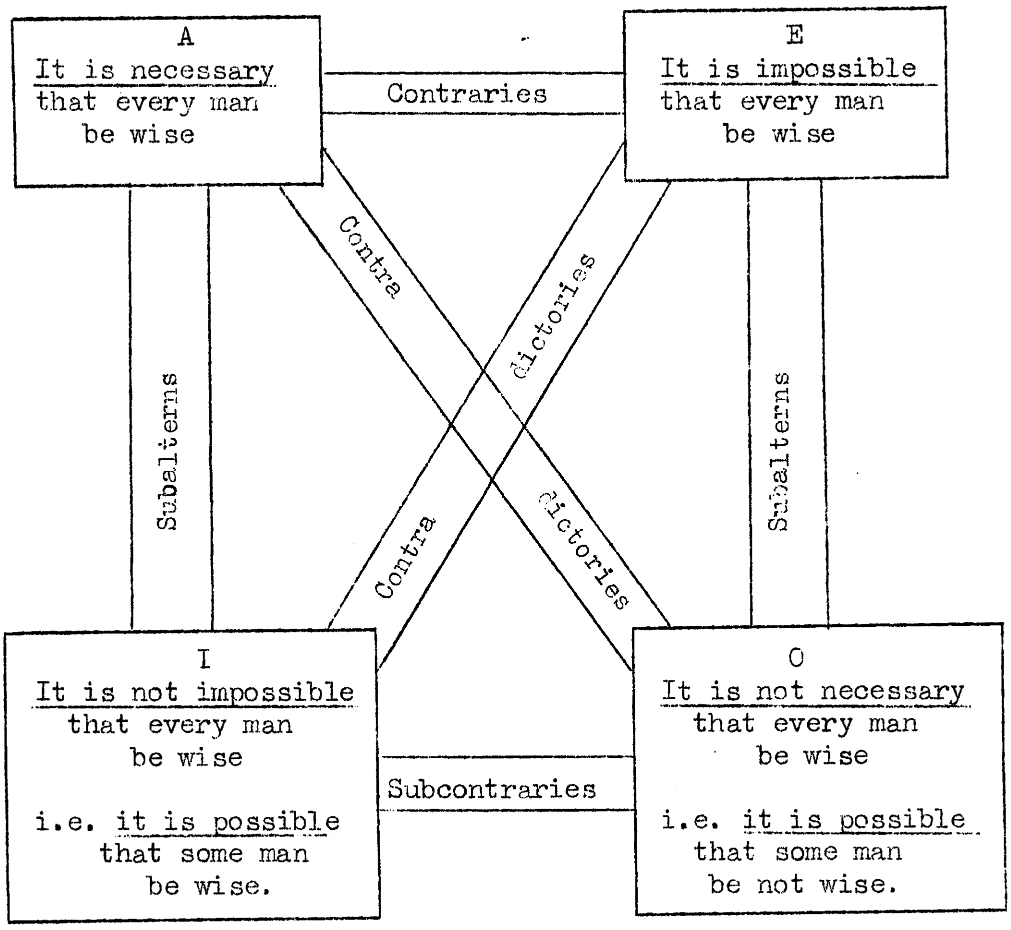
c1a. A designates a proposition in necessary mode;

c1b. E designates a proposition in impossible mode;

c1c. I designates a proposition in possible mode (possible affirmative);

c1d. O designates a proposition in contingent mode (possible negative).

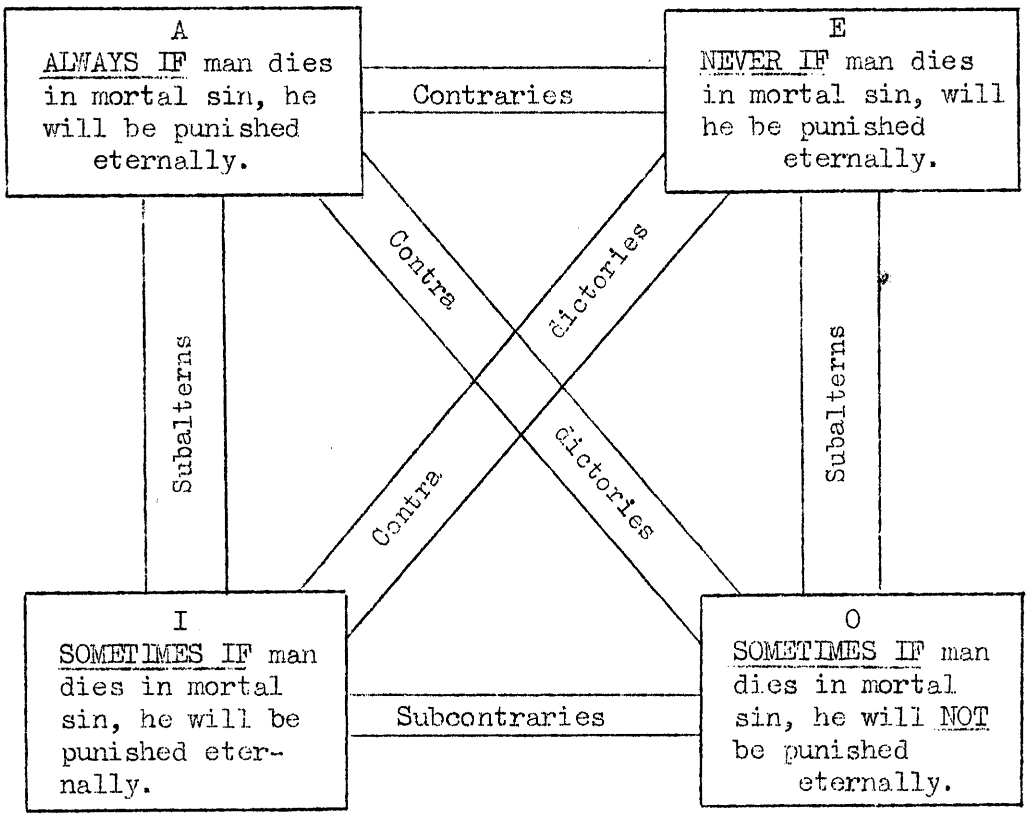
c2. Therefore the "square of opposition" of modal propositions is as shown in the following diagram:-


A
It is necessary that every man be wise
E
It is impossible that every man be wise
Contraries
Subalterns
Contra
dictories
Contra
dictories
Subalterns
I
It is not impossible that every man be wise
i.e. it is possible that some man be wise.
O
It is not necessary that every man be wise
i.e. it is possible that some man be not wise.
Subcontraries

d. AS REGARDS CONDITIONAL PROPOSITIONS:

d1. The signaletic letters are as follows:
d1a. A designates 'always if';
d1b. E designates 'never if';
d1c. I designates 'sometimes if..........is';
d1d. O designates 'sometimes if..........is not'.

d2. Therefore the "square of opposition" of conditional propositions is as shown in the following diagram:-


A
ALWAYS IF man dies in mortal sin, he will be punished eternally.
E
NEVER IF man dies in mortal sin, will he be punished eternally.
Contraries
Subalterns
Contra
dictories
Contra
dictories
Subalterns
I
SOMETIMES IF man dies in mortal sin, he will be punished eternally.
O
SOMETIMES IF man dies in mortal sin, he will NOT be punished eternally.
Subcontraries

e. AS REGARDS COPULATIVE AND DISJUNCTIVE PROPOSITIONS:

e1. The signaletic letters are as follows:

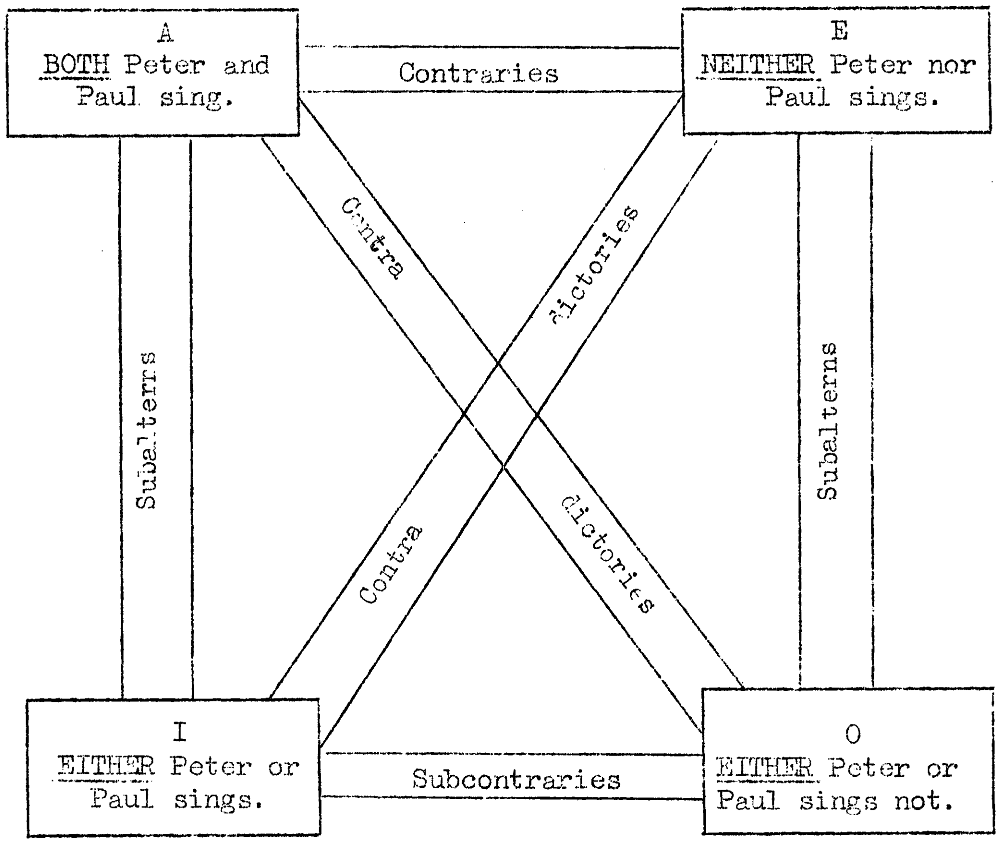
e1a. A designates a copulative proposition whereof both parts are affirmative;

e1b. E designates a copulative proposition whereof both parts are negative;

e1c. I designates a disjunctive proposition whereof both parts are affirmative;

e1d. O designates a disjunctive proposition whereof both parts are negative.

e2. Therefore the "square of opposition" in these propositions is as shown in the following diagram:-


A
BOTH Peter and Paul sing.
E
NEITHER Peter nor Paul sings.
Contraries
Subalterns
Contradictories
Contradictories
Subalterns
I
EITHER Peter or Paul sings.
Subcontraries
O
EITHER Peter or Paul sings not.

G. Wherefrom it is clear that CONTRADICTORY OPPOSITION IS THE GREATEST OF ALL OPPOSITIONS, both in things (where opposition is physical) and in propositions (where opposition is logical).

a. For that opposition is greater which more destroys the opposite.

b. But contradictory opposition alone absolutely and in every way destroys its opposite:

b1. For a contradictory has nothing wherein it might agree with its contradictory;

b2. But other opposites leave something wherein they may agree with their opposite.

c1. CONTRARY opposition:

c1a. If it is PHYSICAL, lies between two positive forms:

c1a1. which agree in the same genus,

c1a2. and can also agree together in the same subject, if they are in remiss degrees, as red and blue can co-exist as violet.

c1b. Likewise, if it is LOGICAL, it does not take away in one proposition all that is in the other, since at least it does not take away universality and distribution:

c1b1. for in universality and distribution contrary propositions must agree;

c1b2. and consequently they have something, to wit, falsity, in which they may agree.

c2. Likewise SUBCONTRARIETY does not take away particularity, and consequently neither truth, but two subcontrary propositions:

c2a. are together particular,

c2b. and can be together true.

c3. PRIVATIVE opposition:

c3a. does not take away aptitude for the opposite form,

c3b. but leaves this aptitude: wherefore at least on this head it leaves some agreement with its opposite.

c4. RELATIVE opposition:

c4a. leaves agreement:

c4a1. in the quasi-genus of being,

c4a2. and indeed in the same proximate genus of relation.

c4b. Therefore those which are relatively opposite:

c4b1. are together by nature,

c4b2. and therefore do not destroy each other (physically),

c4b3. but mutually infer each other.

c5. But in CONTRADICTORY opposition:

c5a. the negation of the one is so pure and absolute that it takes away every agreement with its extreme;

c5b. and so it leaves:

c5b1. neither be,

c5b2. nor aptitude,

c5b3. nor universality,

c5b4. nor particularity.

....

DISSERTATION THREE.

EQUIPOLLENCE OR OBVERSION OF PROPOSITIONS.

219. NOTION OF EQUIPOLLENCE OR OBVERSION: Propositions which signify the same are generally called equipollent.

A. But here equipollence is taken more narrowly, so that equipollence is the equivalence of two propositions, which by means of the negative particle 'not' have been changed from opposites into equivalent.

B. Hence EQUIPOLLENCE is defined: THE PROPERTY OF PROPOSITIONS WHICH, BY MEANS OF THE NEGATING PARTICLE 'NOT', FROM OPPOSITES BECOME EQUIVALENT.

C. Accordingly:

a. In equipollence are to be distinguished:

a1. the term wherefrom which is the OBVERTEND;

a2. the term whereunto which is the OBVERSE.

b. Which may be illustrated by this example:

b1. Let the OBVERTEND be this proposition: 'All men are jealous':

b2. By means of the particle 'not' placed before the subject it becomes equivalent to its contradictory ('some men are not jealous'), for it becomes: 'not all men are jealous': which is the OBVERSE.

220. RULES OF OBVERSION: The rules for obverting opposite propositions into equipollent or equivalent propositions are the following:

A. To obvert a proposition into the equipollent of its CONTRADICTORY: PUT THE NEGATING PARTICLE BEFORE THE SUBJECT.

B. To obvert a proposition into the equipollent of its CONTRARY: PUT THE NEGATING PARTICLE AFTER THE SUBJECT.

C. To obvert a proposition into the equipollent of its SUBALTERN: PUT THE NEGATING PARTICLE BOTH BEFORE AND AFTER THE SUBJECT.

D. NOTE that SUBCONTRARIES do not admit equipollence or obversion: for if negation is put after the subject of an I proposition, what results is not equipollent (equivalent) propositions, but identical propositions.

E. To illustrate the above rules, let us obvert this proposition: 'all men are jealous':-

This OBVERTEND 'all men are jealous'	is obverted into	this OBVERSE: 'NOT all men are jealous', which is EQUIPOLLENT to this: 'some men are not jealous', which is the CONTRADICTORY of the obvertend.
	is obverted into	this OBVERSE: 'All men are NOT jealous', which is EQUIPOLLENT to this: 'no men are jealous', which is the CONTRARY of the obvertend.
	is obverted into	this OBVERSE: 'NOT all men are NOT jealous', which is EQUIPOLLENT to this: 'some men are jealous', which is the SUBALTERN of the obvertend.

....

DISSERTATION FOUR.

CONVERSION OF PROPOSITIONS.

221. NOTION OF CONVERSION: The proposition 'no man is a quadruped', by the inversion of its terms becomes this: 'no quadruped is a man' which is likewise true.

A. This PROPERTY OF A PROPOSITION WHICH, ITS TERMS BEING INVERTED, RETAINS ITS TRUTH, is called CONVERSION.

B. In conversion are to be distinguished:
a. The CONVERTEND: v.g. 'no man is a quadruped'.
b. The CONVERSE: v.g. 'no quadruped is a man'.

C. That conversion may be done rightly, it is required:

a. That the entire S be converted into the entire P: wherefore the proposition: 'Peter sees a snake':

a1. is not converted into this: 'a snake sees Peter',

a2. but into this: '(someone) seeing a snake is Peter'. (Cf. n.66).

b. That the same genus of supposition be kept. (Cf. n.217.B), - as will appear from the next paragraph.

D. It may be NOTED:

a. That many modern writers deem conversion (and also obversion) to be IMMEDIATE INFERENCES or IMMEDIATE ARGUMENTATIONS, which may be expressed in this fashion: 'every man is an animal; THEREFORE some animal is a man'.

b. However:

b1. As will appear from what will be said about reasoning and argumentation in the third book of logic, there are NO immediate argumentations.

b2. But that conversion (and likewise obversion) are not immediate argumentations is already clear:

b2a. Because equipollent, and also converse, propositions, enunciate the same truth, at least partial;

b2b. whereas argumentation is a speech signifying the sequel of one from another.

222. SPECIES OF CONVERSION: Since in the conversion of a proposition, truth must be retained, attention must be paid, as said above (n.221), to the rules of supposition (n.71).

A. In the example given above ('no man is a quadruped': 'no quadruped is a man'), the extremes are inverted without the quantity of the proposition being changed. For both propositions are universal.

a. The reason is, because in negative propositions, P supposes distributively, i.e. universally. (Cf. n.71).

b. This conversion, IN WHICH THE QUANTITY OF THE PROPOSITION IS NOT CHANGED, is called SIMPLE CONVERSION.

B. But if we take this proposition 'every man is an animal':

a. Since P of an affirmative proposition supposes disjunctively, i.e. particularly, (n.71),

b. the quantity of the proposition must be changed, so that the converse is 'some animal is man'.

c. This conversion IN WHICH THE QUANTITY OF THE PROPOSITION IS CHANGED is called ACCIDENTAL CONVERSION.

C. However, in order that conversion, whether simple or accidental, be possible, it is not enough to pay attention to the supposition of P. Heed must also be paid to the supposition of S.

a. In the examples so far given the conversions are valid because the supposition of S is not greater in the converse propositions: since the quantity of each is universal, there is no difficulty.

b. But it is otherwise with S in an O-proposition: for the proposition 'some man is not lazy' cannot be converted into 'every lazy (thing) is not man', because S (some man), which in the former proposition is particular, becomes universal in the latter.

c. Therefore:

c1. The conversion of an O-proposition is done by infinitating the inverted terms, leaving the quantity of the proposition unchanged;

c1a. Thus the convertend 'some man is not lazy' is converted into this converse: 'some non-lazy (thing) is not non-man'.

c1b. This conversion IN WHICH THE QUANTITY OF THE PROPOSITION IS NOT CHANGED, BUT THE TERMS BECOME INFINITE, is called CONVERSION BY CONTRAPOSITION.

c2. An A-proposition also can be converted in this way:

c2a. Thus 'every man is an animal' is converted into 'every non-animal is a non-man'.

c2b. But since in this mode of conversion the extremes become infinite, this mode of conversion is not much employed IN PRACTICE by logicians.

D. Therefore the species of conversion may be thus schematically exhibited:-

Conversion of a proposition is threefold, to wit:

- either SIMPLE, which is CONVERSION IN WHICH THE QUANTITY OF THE PROPOSITION IS NOT CHANGED.
- or ACCIDENTAL, which is CONVERSION IN WHICH THE QUANTITY OF THE PROPOSITION IS CHANGED.
- or BY CONTRAPOSITION, which is CONVERSION IN WHICH THE QUANTITY OF THE PROPOSITION IS NOT CHANGED, BUT THE TERMS BECOME INFINITE.

223. RULES OF CONVERSION: From what has been said:

A. It is clear that:
a. E and I are converted simply;
b. E and A are converted accidentally;
c. A and O are converted by contraposition.

B. Which is thus mnemotechnically summarized:
a. Simply fEcI,
b. Accidentally EvA,
c. by contraposition AstO.

C. Which rules may be thus exemplified:-

EXAMPLES OF CONVERSION

CONVERTEND	KIND OF PROPOSITION	MODE OF CONVERSION	CONVERSE
	f		
'No man is a quadruped'	E		'No quadruped is a man'.
	c	simply	
'Some man is cruel'	I		'Some cruel (thing) is a man'.
'No man is a quadruped'	E		'Some quadruped is not a man'.
	v	accidentally	
'Every man is an animal'	A		'Some animal is a man'.
'Every man is an animal'	A		'Every non-animal is non-man'.
	s	by contra-position	
	t		
'Some man is not lazy'	O		'Some non-lazy (thing) is not non-man'.

D. It is to be NOTED that:
a. Propositions whereof P has the same extension as S, (which is the case when P is a definition of S, as in this 'every man is a rational animal' or 'every man is risible'), are SIMPLY converted.
a1. Thus:
a1a. 'every man is a rational animal' is SIMPLY converted thus: 'every rational animal is a man';
a1b. and 'every man is risible' is SIMPLY converted to this: 'every risible (being) is a man'.

b. But this is NOT CONVERSION PROPERLY SO-CALLED:

b1. For in every affirmative proposition P has disjunctive or particular supposition (n.71,3).

b2. Wherefore the second proposition 'every rational animal is a man':

b2a. no longer says THE SAME TRUTH as the first proposition 'every man is a rational animal'.

b2b. but says a FURTHER, and therefore ANOTHER, TRUTH: for it says:

b2b1. not only that 'some rational animal is a man' - which is the converse of the first proposition, and which is THE SAME TRUTH with it, otherwise said,

b2b2. but also that 'there is no rational animal which is not a man' - which is not the converse of the first proposition, but is ANOTHER TRUTH.

b3. Therefore from this process is had:

b3a. not ANOTHER PROPOSITION EXPRESSING THE SAME TRUTH, such as is had in conversion properly so-called,

b3b. but rather another proposition expressing ANOTHER TRUTH.

……

SECTION TWO.

PREDICATION.

224. ORDER OF PROCEDURE: This section:

A. Will deal:

a. First, with predication in signified act;

b. Secondly, with predication in exercised act.

B. Hence the following order:-

On predication	in signified act	Chapter eighteen.
	in exercised act	Chapter nineteen.

……

CHAPTER EIGHTEEN.

PREDICATION IN SIGNIFIED ACT.

225. ORDER OF PROCEDURE: This treatment of predication in the abstract or in signified act:

A. Will consider:

a. First, the nature of predication;

b. Secondly, the modes of essential predication (of predication 'per se'), since essential predication (predication 'per se') is of the highest importance with regard to demonstration.

B. Hence the following order:-

On predication in signified act	Nature of predication	Article one.
	Modes of predication 'per se'	Article two.

……

ARTICLE ONE.

NATURE OF PREDICATION.

226. TRUE AND FALSE CONJUNCTION OF EXTREMES: Let us take these two propositions: 'A rabbit is an animal', and 'A rabbit is a plant'.

A. The former proposition is true:
a. because P (animal) agrees with S (rabbit),
b. that is, is identified with it in thing (in the real).

B. On the other hand, the latter proposition is false:
a. because P (plant) does not agree with S (rabbit),
b. that is, P is not identified with S in thing (in the real).

227. NECESSITY FOR RULES OF PREDICATION: It follows:

A. That true conjunction of extremes is subjected to certain rules.

B. These rules are called the rules of predication.

228. DEFINITION AND SPECIES OF PREDICATION: Now:

A. PREDICATION is:
a. an ENUNCIATION WHEREBY TO A SUBJECT IS ATTRIBUTED A UNIVERSAL PREDICATE,
b. or the CONJUNCTION OF EXTREMES BASED ON AGREEMENT OR IDENTITY OF SUBJECT AND PREDICATE.

B. But the identity, whereof it is question here, must be rightly understood: in the true proposition 'a rabbit is an animal', there is indeed identity OF THING.
a. For animal, as a superior concept, is identified in thing with rabbit. (n.106).
a1. Nevertheless 'animal' and 'rabbit' are distinguished conceptually (nn.108-112):
a2. for not the same objective concept is expressed by 'animal' and by 'rabbit'.
b. Therefore between 'animal' and 'rabbit':
b1. there is:
b1a. only MATERIAL IDENTITY or IDENTITY OF THING,
b1b. but not FORMAL identity or identity of OBJECTIVE CONCEPT.
b2. In which case the predication is called FORMAL PREDICATION or predication BASED ON MATERIAL IDENTITY.
b3. But if we take these examples: 'a canal is a channel', 'movement is movement'; 'liberty is freedom':
b3a. in which S and P are identical:
b3a1. not only in thing or MATERIALLY,
b3a2. but also as regards objective concepts or FORMALLY.
b3b. Then the predication is called IDENTICAL or TAUTOLOGICAL.

C. But let us further consider formal predication: let us take this proposition: 'Bernborough is a horse'. By the conversion of this proposition we can get this: 'some horse is Bernborough'.
a. These two propositions differ in this, that:
a1. in the former, a superior concept (horse) is predicated of an inferior (Bernborough);
a2. whereas in the latter, on the contrary, an inferior is predicated of a superior.
b. But since S, in every proposition, has itself relatively to P as determinable to determinant, from itself it is inferior; but P superior.
b1. But in the proposition 'some horse is Bernborough', wherein the contrary is the case, the predication is called INDIRECT PREDICATION, which is predication IN WHICH AN INFERIOR IS PREDICATED OF A SUPERIOR.

b2. But in the other proposition 'Bernborough is a horse', wherein a superior is predicated of an inferior, the predication is called DIRECT PREDICATION, which is predication IN WHICH A SUPERIOR IS PREDICATED OF AN INFERIOR.

D. Further:

a. In the proposition 'Bernborough is a horse', in which a superior P agrees with an inferior S, by reason of the ESSENCE of the subject, the predication is called ESSENTIAL PREDICATION or PREDICATION 'PER SE'.

b. But in the proposition 'Bernborough is healthy':

b1. in which P agrees with S:

b1a. not indeed by reason of the essence of the subject,

b1b. but BY REASON OF SOMETHING WHICH IS ACCIDENTAL TO THE SUBJECT,

b2. the predication is called ACCIDENTAL PREDICATION or PREDICATION 'PER ACCIDENS'.

c. This distinction between predication 'per se' and predication 'per accidens' is OF THE HIGHEST IMPORTANCE for demonstration:

c1. which must, as will be seen later:

c1a. beget science, i.e. certain knowledge,

c1b. and therefore must proceed from necessary premisses.

c2. For which reason we shall speak at more length in the following article about essential predication or predication 'per se'.

E. Accordingly, the division of predication may be thus exhibited schematically:-

Predication is
- either identical.
- or formal: which is
  - either INDIRECT.
  - or DIRECT: which is
    - either 'PER ACCIDENS'.
    - or 'PER SE'.

……………………………………

ARTICLE TWO.

MODES OF PREDICATING 'PER SE' OR OF ESSENTIAL PREDICATION.

229. MEANING OF THE WORD 'PER SE': Something must first be said about the meaning of the word 'per se'.

A. IN CONCEPTS:

a. 'PER SE' signifies the same as 'IN SE' (IN SELF);

b. and the two are used promiscuously for defining substance (which is defined 'ens cui competit esse in se vel per se' - being whereto befits be in self or through self).

c. Therefore it is distinguished against 'in alio' (in other) or accident (which is defined 'ens cui competit esse in alio' - being whereto befits be in other).

d. It is not with this acceptation of the word 'per se' that we are concerned here.

B. But here we are concerned with the acceptation which 'PER SE' has IN PROPOSITIONS.

a. In this acceptation it is distinguished against 'PER ACCIDENS' or CONTINGENTLY;

b. and thus taken 'PER SE' signifies NECESSARILY.

230. THE MODES OF PREDICATING 'PER SE': These are expounded by St Thomas in his Commentary on the First Book of the Post. Analytics (lect.10).

A. Let us begin with these examples:

a. 'Man is a rational animal'.

b. 'Man is an animal'.

c. 'Man is rational'.

d. 'Man is risible'.

e. 'An isoceles has three angles equal to two right angles'.

f. 'A sculptor makes a statue'.

B. Now:

a. Of these examples:

a1. in the first three, P is the DEFINITION or PART OF THE DEFINITION of the subject.

a2. in the fourth and fifth, P is a PROPERTY of the subject.

a3. in the last, P is the PROPER act of the subject.

b. Wherefrom it appears that there are three modes of PREDICATING 'PER SE'.

b1. The first mode of predicating 'per se' is when the predicate is the DEFINITION or PART OF THE DEFINITION OF THE SUBJECT.

b2. The second mode of predicating 'per se' is when the predicate is a PROPERTY OF THE SUBJECT.

b3. The third mode of predicating 'per se' is when the predicate expresses the PROPER ACT or PROPER EFFICIENT CAUSALITY OF THE SUBJECT.

b3a. Note here that we say 'PROPER', i.e. inasmuch as such:

b3a1. thus a sculptor, inasmuch as he is a sculptor, makes a statue, for the making of statues is the proper act or proper efficient causality of sculptor;

b3b. but not to this mode of predicating pertains this: 'the sculptor sings a song':

b3b1. for not inasmuch as he is a sculptor does he sing a song;

b3b2. but then is had predication 'per accidens'.

C. Let us now convert these propositions, excepting the last, paying attention to the matter, not only to the form of the propositions.

a. We get these:

a1. From those of the first mode:

a1a. 'Every rational animal is a man'.

a1b. 'SOME animal is man'.

a1c. 'Every rational (being) is man'.

a2. From those of the second mode:

a2a. 'Every risible (being) is a man'.

a2b. 'SOME triangle having three angles equal to two right angles is isoceles'.

b. One proposition (to wit, the second) of each mode had to be converted ACCIDENTALLY, but the others were converted SIMPLY (nn.222-223).

b1. Now:

b1a. those which were converted simply are called CONVERTIBLE propositions;

b1b. while those which were converted accidentally are called NON-CONVERTIBLE propositions.

b2. The reason of the non-convertibility is because:

b2a. in the first mode, P is the generic part of the subject,

b2b. and in the second mode, P is a property flowing from the genus of the subject.

c. Therefore, in each of these two modes:

c1. are to be distinguished:

c1a. a mode of predicating 'per se' PRIMARILY ('per se primo' - essentially and primarily), which is also called predication 'according to that which it is - secundum quod ipsum);

c1b. and a mode of predicating 'per se' SECONDARILY ('per se secundo' - essentially but secondarily),

c2. according as the propositions are convertible or non-convertible.

c3. Which may be thus shown schematically:-

'Man is a rational animal'... 'Man is rational'...........	PRIMARILY	in the FIRST MODE of....	predicating 'PER SE'.
'Man is an animal'...........	SECONDARILY		
'Man is risible.............	PRIMARILY	in the SECOND MODE of......	
'An isoceles has three angles equal to two right angles'...	SECONDARILY		

D. Accordingly the modes of predicating 'per se' or essentially or necessarily may be thus exhibited schematically:-

Essential predication or predication 'per se' or predication necessarily is had ACCORDING AS A SUPERIOR P AGREES WITH AN INFERIOR S BY REASON OF THE ESSENCE OF S: and this may be

- either ACCORDING AS P IS THE DEFINITION OR PART OF THE DEFINITION OF S: and then is had THE FIRST MODE of predication 'per se': but then the proposition may be
  - either CONVERTIBLE: and then is had predication 'PER SE' PRIMARILY in the first mode of predicating 'per se'.
  - or NON-CONVERTIBLE: and then is had predication 'PER SE' SECONDARILY in the first mode of predicating 'per se'.
- or ACCORDING AS P IS A PROPERTY OF S: and then is had THE SECOND MODE of predicating 'per se': but then the proposition may be
  - either CONVERTIBLE: and then is had predication 'PER SE' PRIMARILY in the second mode of predicating 'per se'.
  - or NON-CONVERTIBLE: and then is had predication 'PER SE' SECONDARILY in the second mode of predicating 'per se'.
- or ACCORDING AS P EXPRESSES THE PROPER ACT OR PROPER EFFICIENT CAUSALITY OF S: and then is had THE THIRD MODE of predicating 'per se'.

231. VALUE OF THE DISTINCTION OF THESE MODES: It is to be noted that:

A. The distinction of these modes of predicating 'per se' or necessarily:

a. has not been invented for the purpose of vain subtleties,

b. but "in order that accurate speech be employed in sciences: and how much this contributes to the clarity of ideas and to the attainment of truth, no one is unaware."

B. In justification of this assertion, consider the following example from St Thomas:

a. In the second book 'Contra Gentes' (ch.15), St Thomas lays down this thesis: "All things which are in any way at all, are from God."

b. For the proof of which he advances first this most profound reason:
b1. "Everything which befits something not according to that which it is (non secundum quod ipsum est), befits it through some cause, as white befits a man.
b1a. "For that which has not a cause, is first and immediate.
b1b. "Wherefore it must needs be that it be 'per se' and according to that which it is (secundum quod ipsum).
b2. "But it is impossible that some one befit two and each of them according to that which it is (secundum quod ipsum).
b2a. "For that which is said of something according to that which it is (secundum quod ipsum), does not exceed (go beyond) it: as to have three angles equal to two right angles does not exceed triangle, of which it is predicated, but is to it convertibly.
b2b. "Accordingly, if something were to befit two, it does not befit each of them according to that which each is (secundum quod ipsum est).
b2c. "It is impossible accordingly that some one be predicated of two, so as to be said of neither by reason of a cause; but it must needs be:
b2c1. "either that one is the cause of the other (as fire is the cause of the heat in a mixed body, while nevertheless each is called hot),
b2c2. "or it must needs be that some third be the cause to each of the two (as a fire is to two candles the cause of their being alight).
b3. "But be is said of everything which is.
b4. "Accordingly it is impossible that there be some two, neither of which would have a cause of be: but it must needs be:
b4a. "that both the two in question be through a cause,
b4b. "or that one be to the other the cause of be.
b5. "Therefore it is necessary that from that, to which no thing is a cause of be, be everything which is in any way at all.
b6. "But we have shown above (Bk. I, c.13) that God is such a being, to which no thing is the cause of be.
b7. "From him accordingly is everything which is in any way at all." (Con. Gent. II, c.15).

232. MANNER OF SPEAKING OF THE ANCIENT SCHOLASTICS: It is to be noted:

A. That the ancient Scholastics, following St Thomas (In Post. Anal., lect.10, n.6), speak:
a. not of modes of predicating 'per se',
b. but of modes of saying 'per se'.

B. And they distinguish four modes:
a. Among which they assign as the THIRD MODE OF SAYING 'PER SE':
a1. not a mode of predicating,
a2. but a mode of existing: namely, a mode signifying that something is in self and not in another as in a subject.
b. And the fourth place they assign to the third mode of predicating 'per se', or the mode of predicating according to proper efficient causality.

C. This comparison of the two ways of speaking will appear from the following scheme:-

There are three modes of predicating 'per se', to wit:

- FIRST .... which
  - PRIMARILY: when P
    - is the definition of S.
    - is the specific difference of S.
  - SECONDARILY: when P is the genus of S.
- SECOND .... which
  - PRIMARILY: when P is a property flowing from the specific difference of S
  - SECONDARILY: when P is a property flowing from the genus of S.
- THIRD: when P expresses the proper efficient causality of S............ which

corresponds to the ......

- FIRST
- SECOND
- THIRD
- FOURTH

mode of SAYING 'per se'.

……

CHAPTER NINETEEN.

PREDICATION IN EXERCISED ACT.

233. ORDER OF PROCEDURE: It is question here of the APPLICATION, ACCORDING TO THE DIVERSITY OF MATTER, of what has been said in the previous chapter about the predication taken in the abstract or in signified act. (Cf. John of St Thomas: Cursus Phil. I, pp.364ss). Accordingly:

A. Certain pre-ambles will *first* be recalled. (n.234).

B. Thereafter:
a. *First*, will be treated predication of a concrete about a concrete. (n.235.
b. *Secondly*, will be treated predication of an abstract about an abstract. (n.236).
c. *Thirdly*, will be treated predication of a concrete about an abstract, and vice versa (n.237).

234. PRE-AMBLES: It must first be recalled that:

A. An ABSTRACT CONCEPT is that whereby an essence is abstracted from the subject having it (n.49).

a. Thus:

a1. 'humanity' is the essence or nature whereby a subject is man;

a2. 'corporeity' is the essence or nature whereby a subject is a body.

b. This concept is as it were a part with respect to the concrete universal.

c. It arises by formal abstraction. (Cf. n.29).

B. A CONCRETE CONCEPT:

a. which arises by total abstraction (cf. n.29), whereby a superior universal (v.g. animal) abstracts from (and accordingly contains in potency) inferiors (v.g. from man, from Peter),

b. is with respect to its inferiors a potential whole. (Cf. n.121).

c. Hence a superior and inferior concrete contain the same whole:

c1. but the superior indeed contains it indeterminately,

c2. whereas the inferior contains it determinately.

235. PREDICATION OF CONCRETE ABOUT CONCRETE: Regarding predication of a concrete about a concrete, a superior P is rightly predicated about an inferior S.

A. In SUBSTANTIAL concepts there is no difficulty. Thus 'man' is rightly predicated about 'Peter', because they signify the same whole.

B. In ACCIDENTALS also it is clear: thus in the propositions 'the white is coloured', and 'Peter is small', predication is rightly made.

a. An accidental concrete (v.g. 'white', 'coloured', 'small'):

a1. signifies directly (in recto) the very form of the accident (v.g. whiteness, colour, smallness),

a2. but connotes obliquely (in obliquo) a subject of inhesion (n.49,C).

b. Therefore:

b1. the identity of S and P may be an identity of form: colour is a genus, whiteness a species: hence these concepts can be predicated one of the other, as a superior of an inferior.

b2. but in the other example 'Peter is small':

b2a. there is:

b2a1. not identity of form,

b2a2. but identity of subject of inhesion;

b2b. therefore 'small' is rightly predicated of 'Peter'.

c. Note however that:

c1. the former predication, to wit, 'coloured' of 'white', is essential or 'per se',

c2. whereas the latter, to wit, 'small' of 'Peter', is accidental or 'per accidens' (n.228, D).

236. PREDICATION OF ABSTRACT ABOUT ABSTRACT: Regarding predication of an abstract about an abstract, a superior P is rightly predicated of an inferior S.

A. In ACCIDENTALS (v.g. 'whiteness is a quality').

a. For there is no difference between:

a1. predication of abstract about abstract in accidentals,

a2. and predication of concrete about concrete in substantials.

b. For the abstract of an accident is in a certain way some whole not having its termination save in a concrete substance.

B. In SUBSTANTIALS (v.g. 'humanity is animality'), the predication has two significations:

a. either the inferior ('humanity') is taken reduplicatively (cf. n.207, D):

a1. then the meaning is 'humanity inasmuch as it is humanity is animality';

a2. and then the predication is not rightly made, because by reason of the reduplication the subject ('humanity') is taken as signifying:

a2a. not humanity subsisting,

a2b. but only the specificative difference of the nature: which is excluded from the predicate ('animality').

b. Or:

b1. the subject is taken:

b1a. not reduplicatively,

b1b. but specificatively;

b2. then the meaning is: 'humanity is animality' (determined indeed by rationality), which is equivalent to this: 'to be a man is to be an animal' (though indeed a rational animal);

b2a. and then the predication is valid, because there is had in P a potential whole whereof S is the actual whole.

237. PREDICATION OF CONCRETE ABOUT ABSTRACT OR VICE VERSA: It is enough to note here the following:

A. GENERALLY:

a. not rightly is predication made:

a1. either of a concrete about an abstract,

a2. or of an abstract about a concrete;

b. because they are to each other as part and whole; which are not identified.

B. But there are these EXCEPTIONS:

a. When predication is made in divine things:

a1. in which the same is the abstract and the concrete: (God is divinity).

a2. because in God there is no composition, not even metaphysical.

b. When predication is made in transcendentals (being, one, true, good):

b1. because the same are:

b1a. being (concrete) and entity (abstract),

b1b. one (concrete) and unity (abstract),

b1c. true (concrete) and truth (abstract),

b1d. good (concrete) and goodness (abstract);

b2. for the transcendental properties are identified with being itself, or with entity itself;

b3. but being can add to entity nothing which would not be entity.

c. When predication is made in quantity (v.g. 'quantity is quantic', 'extension is extended', 'number is numerosity', 'numerosity is number', 'inch-length is an inch-long'):

c1. for quantity, even separated from a subject which by it becomes quantic, has parts;

c2. but what has parts is said to be extended and quantic.

……………………………………………………………………

……………………………………………………………………

BOOK THREE.

....
....
...

THIRD PART OF LOGIC: ON ILLATION.

....
....
...

238. CONNEXION WITH PRECEDING PART: Just as predicability is ordered towards predication, so predication is ordered towards illation.

A. For, as is explained in psychology, the human intellect, on account of its imperfection, requires, for the obtaining of perfect knowledge of things:
a. not only predication,
b. but also illation or inference.

B. And therefore, after the study of predication, occurs the study of illation.

239. GENERAL VIEW OF THIS PART: However, since illation is made in reasoning:

A. Before approaching illation itself, certain things must be premised, in a FIRST SECTION, regarding:
a. reasoning, as it is an act of reason: for thus is it the cause of illation;
b. reasoning, as it is the work of this act: which must be considered:
b1. both in itself,
b2. and in its sign, which is argumentation.

B. Thereafter illation itself will be considered: but illation can be considered in two ways, to wit:

a. Both formally or according as it is the very form of reasoning:
a1. and thus, since it is diverse according to the diverse species of reasoning,
a2. it will be considered:
a2a. in a SECOND SECTION, as it is the form of deductive reasoning;
a2b. and in a THIRD SECTION, as it is the form of inductive reasoning.

b. and materially or in its application to diverse matters:

b1. which is the consideration of reasoning as it is proof, which regards not only the form of reasoning, but also its matter.

b2. But, since reasoning as it is proof or argument, is reduced to three genera, to wit, to sophistic proof, to probable proof, and to certain or scientific proof, which is called demonstration.

b2a. In a FOURTH SECTION will be considered sophistic proof.

b2b. And in a FIFTH SECTION will be considered probable proof.

b2c. And thereafter will be treated certain or scientific proof or demonstration: but since the consideration of this is threefold:

b2c1. In a SIXTH SECTION will be considered scientific or certain proof or demonstration in itself.

b2c2. In a SEVENTH SECTION will be considered scientific or certain proof or demonstration in its preparation, which preparation is the discovery of principles.

b2c3. And thereafter will be considered scientific or certain proof or demonstration in its effect, which effect is science: but since the consideration of science is twofold:

b2c3a. In an EIGHTH SECTION will be considered science in general.

b2c3b. And in a NINTH SECTION will be considered the sciences in special.

C. Which may be thus exhibited schematically:-

- On illation
  - PRE-AMBLES to the study of illation or on reasoning in general (SECTION ONE):
    - as it is the ACT of reason.
    - as it is the WORK of reason
      - in itself.
      - in its sign.
  - ON ILLATION itself
    - Formally considered
      - On the SYLLOGISM (SECTION TWO).
      - On INDUCTION (SECTION THREE).
    - Materially considered, or on proof
      - false or sophistic (SECTION FOUR).
      - true
        - but only probable (SECTION FIVE).
        - and certain or scientific
          - considered absolutely (SECTION SIX).
          - considered relatively
            - to its causes: (SECTION SEVEN).
            - to its effect which is science
              - considered in general (SECTION EIGHT).
              - considered in special (SECTION NINE).

....

....

SECTION ONE.

....

....

PRE-AMBLES TO THE STUDY OF ILLATION

OR

ON REASONING WHICH IS THE CAUSE OF ILLATION, AND ITS WORK.

....

....

240. ORDER OF PROCEDURE: Illation is found in reasoning.

A. But reasoning can be considered in two ways, to wit:

a. PSYCHICALLY indeed, inasmuch as it is the ACT of reason:
a1. Thus taken, it is the CAUSE of illation;
a2. but thus taken:
a2a. it pertains more to psychology;

a2b. for which reason, it will be treated briefly here.

b. And LOGICALLY, inasmuch as it is the WORK of the third operation of the intellect (nn.14, 17, 19). But thus taken, it can be considered
b1. either in itself,
b2. or in its sign, which is argumentation.

B. Accordingly, here we shall consider:
a. First, the nature of reasoning as it is the ACT of reason.
b. Secondly, reasoning as it is the WORK of the intellect, or taken logically: and indeed:
b1. In the first place, in itself;
b2. In the second place, in its sign.

C. Hence the following order:-

On reasoning which is the ACT of reason, and its WORK:	As it is the ACT of reason		Chapter twenty.
	As it is the intellect's WORK	in itself	Chapter twenty-one.
		in its sign	Chapter twenty-two.

……

CHAPTER TWENTY.

NATURE OF REASONING AS IT IS THE ACT OF REASON.

241. THE NATURE OF REASONING: Let us take:

A. This example:

'Every man is mortal.
'But Peter is a man.
'Therefore Peter is mortal'.

B. In this case:
a. there is:
a1. not merely the emission of three judgments successively, as if they had no connexion between them,
a2. but the mind proceeds from one to another to obtain the truth ('Peter is mortal'), which was VIRTUALLY contained in the first judgment ('every man is mortal').
b. This passage is effected by the aid of the second judgment.

C. Therefore:
a. It is not sufficient for reasoning:
a1. that one thing or one truth be known AFTER another;
a2. nor that one thing or one truth be known IN another (v.g. as an effect in its cause),
b. but it is required that FROM the knowledge of one the mind proceed to the knowledge of the other.
c. Therefore:
c1. an intellect which understands comprehensively (n.51, F), to wit, the divine intellect and the angelic intellect, understands not discursively or ratiocinatively;
c2. but to be rational or to reason is proper to man.

D. This ACT WHEREBY INTELLECT PROCEEDS FROM ONE OBJECT UNDERSTOOD TO ANOTHER TO KNOW AN INTELLIGIBLE TRUTH is REASONING (I, q.79, a.8).

E. Therefore psychically considered, reasoning is a simple act of the mind, concluding the consequent from the antecedent, wherein it is VIRTUALLY contained.

F. In the example given, the consequent is the judgment 'Peter is mortal', considered:

a. not in itself,

b. but IN ITS RELATION with the preceding judgments whereof it is the effect: - which indeed is indicated by the very name 'consequent'.

G. But the antecedent is the second judgment ('Peter is a man'), taken indeed, not in itself, but UNDER THE LIGHT OF THE FIRST JUDGMENT (or, as is said, taken as subsumed to the first judgment).

a. Therefore both the first and second judgments, which are the causes of the consequent, belong to the antecedent:

b. But indeed:

b1. The first as a REMOTE cause:

b1a. inasmuch as it contains in itself:

b1a1. but indeterminately - as a species indeterminately contains the individuals beneath it,

b1a2. and as determinable,

b1b. the truth which is determinately contained in the consequent.

b2. But the second as a PROXIMATE cause, inasmuch as it determines the truth to be brought forth in the consequent.

242. TRANSIT TO A TRUTH FORMALLY DIVERSE: But because the truth contained in the consequent, is found indeterminately in the first judgment of the antecedent, it is said to be VIRTUALLY contained in it. Wherefrom it appears that:

A. The mind, by means of reasoning, progresses in the knowing of truth, inasmuch as it passes:

a. from a virtual truth,

b. to a truth:

b1. materially the same,

b2. but formally (i.e. determinately) DIVERSE;

B. Or - what is the same - passes:

a. from ONE truth formally known ('every man is mortal'),

b. to ANOTHER truth formally known ('Peter is mortal').

243. NO IMMEDIATE INFERENCE PROPERLY SO-CALLED: It follows from what has been said that THERE IS NO IMMEDIATE INFERENCE OR IMMEDIATE ILLATION properly so-called. (Cf. n.221, D).

A. For illation or inference properly so-called essentially requires that the mind progresses TO ANOTHER TRUTH, to wit, to a truth FORMALLY DIVERSE.

B. Therefore it does not suffice for the essence of inference properly so-called that the mind pass TO ANOTHER PROPOSITION EXPRESSING THE SAME TRUTH.

a. And indeed it is to be observed that:

a1. ANOTHER PROPOSITION is had if only the concepts or terms contained in the proposition are otherwise disposed, or are made different according to implicit and explicit.

a2. But ANOTHER TRUTH is had ONLY IF it is ANOTHER IDENTITY which is affirmed (or denied), to wit, an identity between concepts distinct by a distinction greater than that which lies between the implicit and the explicit, as explained above (n.214).

b. For by illation the mind:

b1. PROGRESSES or ADVANCES (i.e. acquires FURTHER TRUTH, i.e. ANOTHER TRUTH),

b2. and does not, so to speak, merely step sideways, diversely knowing THE SAME TRUTH.

c. Which TWO MOVEMENTS of the mind may be illustrated:

c1. from these two examples:

c1a. 'The SPIRITUAL is immortal.
But the soul of man is spiritual.
Therefore THE SOUL OF MAN is immortal'.

c1b. 'Every man IS an animal.
Therefore some animal IS a man'.

c2. In the former example the mind ADVANCES to a NEW TRUTH: for when it knew 'the spiritual is immortal', it was knowing only the IDENTITY between 'the spiritual' and 'immortal':

c2a. and was not knowing:
c2a1. either the identity between 'the soul of man' and 'spiritual',
c2a2. or the identity between 'the soul of man' and 'immortal'.
c2b. and indeed the mind may have been still ignorant:
c2b1. not only of the identity between 'the soul of man' and 'immortal',
c2b2. but even of the identity between 'the soul of man' and 'spiritual'.

c3. But in the latter example the mind merely STEPS SIDEWAYS, so to speak, to ANOTHER KNOWING of the SAME TRUTH:

c3a. For WHAT IT KNEW when it knew 'every man is an animal' was the IDENTITY between these two: 'man' and 'some animal' (cf. n.71, B.a).

c3b. and WHAT IT KNOWS when it knows 'some animal is man' is the SAME IDENTITY, i.e. the identity between the SAME TWO.

C. Accordingly care is to be taken not to be deceived by the use of the word 'therefore' and similar words:

a. For sometimes such words signify inference properly so-called,

b. but sometimes not, - for sometimes they signify only that IF some proposition expresses a truth, then ANOTHER PROPOSITION also expresses a truth, (BUT INDEED THE SAME TRUTH).

D. From the above, it is easily seen that the opinion of those modern writers who assert that CONVERSION and OBVERSION, are IMMEDIATE inferences, is to be rejected, as said above (n.221, D).

E. However:

a. By reasoning (inference) it may be verified that the change in the logical structure of a proposition by conversion or obversion does not affect the truth of the proposition.

b. Thus is this verified with regard to the second example above given (B.c1b):

'That which is predicated, according to some of its inferiors, of every man, is identical, according to some of its inferiors, with man.
But 'animal' is predicated according to some of its inferiors, of every man.
Therefore 'animal', according to some of its inferiors, is identical with man.

F. It may indeed be conceded that the name 'inference' may be taken in a broad sense to signify:

a. "every passage from one proposition to a second proposition which is necessarily true if the first is true (even if these two propositions do nothing but state the same truth". (Maritain: Introduction to Logic, p.169); or, in other words, every passage which may be designated by such a word as 'therefore'.

b. And indeed "such is the traditional use made of this word by the ancients in their treatises 'de consequentius'." (Maritain: ibid.)

c. But then the name 'inference' is taken improperly.

……………………………………

CHAPTER TWENTY-ONE.

REASONING AS IT IS A WORK OF THE INTELLECT.

244. ORDER OF PROCEDURE: The treatment of reasoning as it is the intellect's WORK considered in itself:

A. Considers:
a. *First*, the nature of reasoning as it is the work of the intellect, or logically viewed.
b. *Secondly*, the laws of reasoning as they bespeak the exigencies of its nature.

B. Hence the following order:-

Reasoning logically considered
- On its nature....................................Article one.
- On its laws......................................Article two.

....

ARTICLE ONE.

NATURE OF REASONING LOGICALLY CONSIDERED.

245. THE MATTER OF REASONING: Under this logical aspect reasoning is a complex artificial work or construct in which diverse things are to be distinguished, to wit:

A. Three *judgments* ('*every man is mortal*', '*Peter is a man*', '*Peter is mortal*'):
a. whereof:
a1. the first *two* are called the premisses,
a2. but the third the *conclusion*.
b. These judgments constitute the *PROXIMATE matter* of the reasoning.

B. But:
a. These judgments consist of *concepts* (*terms*), but not of any concepts at random.
a1. In the example given, are found *three* concepts only, each of them occurring twice.
a2. These are the *REMOTE matter* of the reasoning.
b. With regard to these concepts:
b1. observe that:
b1a. two of them are found, each once in the premisses and once in the conclusion;
b1b. whereas the third is found twice in the premisses.
b2. Whereas:
b2a. the *former* are called the *extremes*, (or S and P),
b2b. the *third* (i.e. that which is found twice in the premisses) is called the *medium-concept* or *middle term*, or simply, the *medium* (M): for it is by the medium of it that the extremes are compared with each other.
b3. Thus, in the example given:
b3a. '*mortal*' and '*Peter*' are each compared with '*man*',
b3b. and by the medium of '*man*' with each other.
c. But:
c1. since in every judgment:
c1a. S is the *MINOR* concept, because it is subject to P,
c1b. wherefore P is called the *MAJOR* concept;
c2. therefore:
c2a. the S of the conclusion is called the *MINOR* extreme,

c2b. and the P of the conclusion is called the MAJOR extreme.
d. From these two the premisses get their name:
d1. The MAJOR premiss is the PREMISS WHICH CONTAINS THE MAJOR EXTREME, i.e. P of the conclusion.
d2. The MINOR premiss is the PREMISS WHICH CONTAINS THE MINOR EXTREME, i.e. S of the conclusion.

246. THE FORM OF REASONING: THE ARTIFICIAL DISPOSITION OF CONCEPTS FOR THE MANIFESTING OF THE ILLATIVE CONNEXION OR CONSEQUENCE, that is, THE SEQUENCE OF THE CONSEQUENT FROM THE ANTECEDENT according to CAUSALITY and not only according to SUCCESSION, is the FORM of the reasoning.

A. In the example given above;
a. the consequent flows from the antecedent:
a1. according to a right disposition of concepts,
a2. and by reason of the matter of the concepts.
b. And therefore the consequence is said to be good:
b1. MATERIALLY,
b2. and FORMALLY.

B. But it is otherwise in the following:

a. Examples:

a1.
'Every man is mortal.
But this dog is a man.
Therefore this dog is mortal'.

a2.
'Every man is mortal.
But a dog is not a man.
Therefore a dog is not mortal'.

a3.
'Some man is wise.
But Peter is a man.
Therefore Peter is wise'.

b. In the first of these reasonings:
b1. The consequence is formally good, because the concepts are so disposed, that the minor extreme is under M, and M is under the major extreme:
b1a. thus:-

mortal

man

dog

b1b. Therefore, if attention be paid only to the disposition of the concepts, 'mortal' is RIGHTLY predicated of 'dog'.
b2. But MATERIALLY, or paying attention to the matter of the reasoning, the consequence is bad.
b2a. Note that we say 'bad', not 'false':
b2b. for the conclusion is true, not indeed by virtue of the consequence, but accidentally (per accidens): for one premiss is false.

c. In the second example, the consequence neither formally, nor materially, is good:
c1. Not materially, as is clear.
c2. Nor formally:
c2a. because, paying attention only to the disposition of the concepts, it is illegitimately concluded 'a dog is not mortal':
c2b. for:
c2b1. P is universal in this conclusion (cf. n.71, B.b),
c2b2. whereas in the Major premiss it is only particular.

d. In the third example:
d1. The consequence is materially good, but formally bad:
d1a. Materially good indeed, for the premisses are true.
d1b. But formally bad, because M is in each premiss particular, for which reason it does not necessarily signify the same part of the universal:

d1b1. thus:-

wise

some man .... some man

Peter

d1b2. In which case, there is no illation:

d1b2a. because, in default of a right disposition of concepts in the premisses, there is no antecedent:

d1b2b. for the antecedent is the minor taken under the light of the major: which presupposes a right disposition of concepts.

....

ARTICLE TWO.

THE LAWS OF REASONING.

247. TWO LAWS: From what has been said, two laws follow.

248. FIRST LAW: The first law is this: FROM AN ANTECEDENT, ALWAYS FOLLOWS A CONSEQUENT: YET FROM A FALSE ANTECEDENT, SOMETIMES FOLLOWS A TRUE CONSEQUENT, BUT ACCIDENTALLY.

A. The first part (From an antecedent, always follows a consequent) is clear from the nature of an antecedent.

B. The second part however is evident:

a. That from a false antecedent may follow a true consequent, is clear from the first example given above (n.246, B.a1).

b. But that this occurs accidentally (per accidens) only, is proved from this:

b1. that:

b1a. the consequent is the effect of the antecedent;

b1b. but an effect follows necessarily the nature of its cause;

b1c. therefore from a false antecedent only a false consequent can follow 'per se' or necessarily.

b2. Therefore a true consequent cannot follow unless owing to the intervention of a cause extraneous to the falsity of the antecedent, to wit, owing to the artificial disposition of the concepts.

b3. Therefore the true consequent follows:

b3a. from the ANTECEDENT indeed,

b3b. but not from the falsity thereof.

249. SECOND LAW: The second law is this: THE CONCLUSION ALWAYS FOLLOWS THE WORSE PART.

A. The 'worse part' is to be understood thus:

a. A negative proposition is called worse than an affirmative.

b. A particular proposition is called worse than a universal.

B. Therefore:

a. The meaning is:

a1. From a negative antecedent always follows a negative conclusion.

a2. From a particular antecedent always follows a particular conclusion.

b. Which is illustrated from these examples:

b1. 'An animal is sentient.......................AFFIRMATIVE.
But a sunflower is NOT sentient..............NEGATIVE.
Therefore a sunflower is NOT an animal'.......NEGATIVE.

b2. 'A sense is NOT cognoscitive of universals......NEGATIVE.
But intellect is cognoscitive of universals......AFFIRMATIVE.
Therefore intellect is NOT a sense'.............NEGATIVE.

b3. 'Every man is endowed with intellect............UNIVERSAL.
But SOME biped is a man........................PARTICULAR.
Therefore SOME biped is endowed with intellect'..PARTICULAR.

b4. 'Every man is endowed with intellect............UNIVERSAL.
But SOME biped is not endowed with intellect....PARTICULAR.
Therefore SOME biped is not a man...............PARTICULAR.

C. This law is EVIDENT:

a. AS REGARDS A NEGATIVE ANTECEDENT:
a1. For:
a1a. A negative antecedent signifies:
a1a1. either that the minor extreme does not agree with the middle-term (as in the first example above given),
a1a2. or that the middle-term does not agree with the major extreme (as in the second example above given).
a1b. Therefore it follows that the minor extreme does not agree with the major extreme.
a2. Which may be illustrated thus in a mathematical manner:-

If $C = B$	But if $C = B$	Or if $C \neq B$
and $A = C$	but $A \neq C$	but $A = C$
Then $A = B$.	Then $A \neq B$.	Then $A \neq B$

b. AS REGARDS A PARTICULAR ANTECEDENT:
b1. For a particular antecedent signifies that part only of the minor extreme agrees (as in the third example above given), or agrees not (as in the fourth example above given), with M.
b2. Therefore part only of the minor extreme can agree (as in the third example), or agree not (as in the fourth example), with the major extreme

....

CHAPTER TWENTY-TWO.

....

THE SIGN OF REASONING OR ARGUMENTATION.

....

250. NOTION OF ARGUMENTATION: From what has been said, it is clear that the SIGN of a reasoning, which is called ARGUMENTATION is: A SPEECH SIGNIFYING THE SEQUENCE OF ONE FROM ANOTHER - "ORATIO SEQUELAM UNIUS EX ALIO SIGNIFICANS". Nor does this require any further explanation.

251. TWOFOLD ARGUMENTATION: But argumentation or the sign of a reasoning is twofold, to wit:

A. DEDUCTIVE ARGUMENTATION or SYLLOGISM, (which will be dealt with in section two).

B. INDUCTIVE ARGUMENTATION or INDUCTION, (which will be dealt with in section three).

....

....

SECTION TWO.

SYLLOGISM.

252. DISTINCTION OF FORMAL AND MATERIAL LOGIC: Already in the pre-ambles to the study of illation (in section one), something has been said about illation, since in defining the nature of reasoning, or in defining its work or the sign thereof, it is impossible to abstract altogether from illation.

A. Now, however, ILLATION ITSELF is to be directly considered.

B. But illation is diverse, as said above (n.239,B), according to the diverse species of reasoning and argumentation.

a. Therefore:

a1. there is one consideration which is concerned with the form of deductive reasoning or deduction or the syllogism: which consideration constitutes the present section (section two).

a2. and there is another consideration which is concerned with the form of inductive reasoning or induction: which consideration will constitute the following section (section three).

b. For the form of reasoning is nothing else than the very ILLATION ITSELF.

C. Wherefore:

a. This treatment, consisting of SECTIONS TWO AND THREE, of illation FORMALLY considered, is rightly called FORMAL LOGIC.

b. Whereas the treatment, consisting of SECTIONS FOUR TO FIFTEEN inclusively, of illation in its application to diverse matters, is rightly called MATERIAL LOGIC.

D. Which may be thus schematically set forth:-

The study of illation
- FORMALLY considered (sections II-III) is FORMAL LOGIC.
- MATERIALLY considered (sections IV-XV) is MATERIAL LOGIC.

253. ORDER OF PROCEDURE: This section, treating of the syllogism:

A. Will consider:
a. First, the categorical syllogism.
b. Secondly, the hypothetic syllogism.
c. Thirdly, other divisions of the syllogism.

B. Hence the following order:-

On the syllogism
- The categorical syllogism..................Chapter twenty-three.
- The hypothetic syllogism..................Chapter twenty-four.
- Other divisions of the syllogism..........Chapter twenty-five.

……

CHAPTER TWENTY-THREE.

……………………

THE CATEGORICAL SYLLOGISM.

……………………

254. ORDER OF PROCEDURE: This treatment of the categorical syllogism:

A. Will consider:
a. First, the notion of it.
b. Secondly, its principles: which indeed will be treated:
b1. in the first place, in themselves;
b2. in the second place, with reference to the laws whereby the supreme principle is applied.
c. Thirdly, its forms; and indeed:
c1. in the first place, its figures and moods;
c2. in the second place, the reduction of its moods.
d. Fourthly, the value of it and of its reduction.
e. Fifthly, the theory of the quantification of the predicate.

B. Hence the following order:-

On the categorical syllogism:
- Its notion……………………………………Article one.
- Its principles
  - in themselves…………………Article two.
  - in the laws whereby the supreme principle is applied…..Article three.
- Its forms
  - Its figures and moods……………Article four.
  - Reduction of its moods……………Article five.
- Its value and that of its reduction…………Article six.
- Quantification of the predicate………………Article seven.

……………………

ARTICLE ONE.

NOTION OF CATEGORICAL SYLLOGISM.

255. ITS NATURE: From the examples given in the preceding section, it is already apparent what a categorical syllogism is. For all the propositions were categoric (cf. n.207, B).

A. Each of those examples was an ARGUMENTATION IN WHICH A CONCLUSION IS DRAWN FROM A MORE UNIVERSAL TRUTH TO A LESS UNIVERSAL TRUTH CONTAINED IN IT: such is the CATEGORICAL SYLLOGISM.

B. This definition is based upon the EXTENSION of the terms (of the concepts):
a. but extension is a PROPERTY of a term (nn.43-47);
b. and therefore this definition is a definition of the syllogism FROM A PROPERTY (cf. n.169, B).

C. The ESSENTIAL definition of the syllogism, on the other hand, is based on the ESSENCE or COMPREHENSION of the terms (concepts), and therefore is to be reposed in this, that S is united to P by the medium of M:

a. and accordingly it is an ARGUMENTATION WHICH PROCEEDS FROM A UNIVERSAL TRUTH TO ANOTHER UNIVERSAL TRUTH.

b. This essential notion of the syllogism IS OF THE HIGHEST IMPORTANCE, as will appear later:

b1. both to distinguish the syllogism from induction,

b2. and to vindicate the value of the syllogism.

256. CATEGORICAL SYLLOGISM MAY BE CONSTRUCTED FROM HYPOTHETIC PROPOSITIONS: From the notions exposed:

A. It is clear that ALL syllogisms which proceed from a universal proposition to a universal proposition are CATEGORICAL syllogisms:

a. whether they are composed from categoric propositions,

b. or from hypothetic propositions (cf. n.207, B).

B. For example:

a. Let us take this:

'If Peter moves himself, he is living.
But if Peter runs, he moves himself.
Therefore if Peter runs, he is living'.

b. This syllogism is CATEGORIC, and it signifies the same as the following syllogism constructed from categoric propositions:

'That which moves itself is living.
But that which runs moves itself.
Therefore that which runs is living'.

....

ARTICLE TWO.

PRINCIPLES OF THE CATEGORIC SYLLOGISM.

257. THE PRINCIPLES: From the very notion of the categorical syllogism these things follow:

A. The first principle is drawn from the essential notion (n.255,C):

a. For the mind cannot proceed from a universal truth to another universal truth save BY REASON OF THE IDENTITY of the terms which are contained in the propositions. For, as we have seen above (n.200), predication itself is based on identity.

b. WHEREFROM it is clear that THE SUPREME PRINCIPLE OF THE CATEGORICAL SYLLOGISM is THE PRINCIPLE OF IDENTITY AND OF DISCREPANCY, which is thus formulated: THOSE WHICH ARE THE SAME WITH ONE THIRD ARE ALSO THE SAME WITH EACH OTHER; AND THOSE WHEREOF ONE IS THE SAME WITH A THIRD AND THE OTHER IS DISCREPANT FROM IT, ARE DIVERSE FROM EACH OTHER.

b1. NOTE however that M, with which the extremes are identified, must be taken under the same formal aspect, and therefore must be one both in thing and in concept (re et ratione): as St Thomas writes: "whatsoever are the same to one and the same, are the same to each other, IN THOSE WHICH ARE THE SAME IN THING AND IN CONCEPT, as tunic and garment; but not in those which differ in concept" (I, q.28, a.3 ad 1):

b1a. for otherwise there would not be comparison with ONE THIRD, but with TWO;

b1b. for the comparison is made with concepts: wherefore there must be:

b1b1. not only identity in thing (in re),

b1b2. but also identity in concepts (ratione).

b1c. For which reason (i.e. owing to lack of identity in concepts):

b1c1. not valid:

b1c1a. is this argument:

'Nationality is an abstract notion.
But Churchill's nationality is English.
Therefore an abstract notion is English'.

blc1b. For under two diverse formal aspects (as not the same in concept) is 'nationality' identified with 'abstract notion' and with 'Engl

blc1b1. for it is identified with 'abstract notion' in the first proposition according as 'nationality' has simple or logical supposition (cf. n.70, C);

blc1b2. while it is identified with 'English' in the second proposition according as 'nationality' has personal or real supposition (cf. n.70, C).

blc2. Nor valid:

blc2a. is this argument:

'The Father is God.
The Son is (the same) God.
The Holy Ghost is (the same) God.
Therefore the Father, the Son and the Holy Ghost are the same with each other'.

blc2b. For:

blc2b1. in the first proposition 'God' FORMALLY signifies God INSOFAR AS HE IS GENERATING;

blc2b2. in the second proposition 'God' FORMALLY signifies God INSOFAR AS HE IS GENERATED;

blc2b3. in the third proposition 'God' FORMALLY signifies God INSOFAR AS HE PROCEEDS FROM THE FATHER AND THE SON.

b2. NOTE MOREOVER that in the second part of the principle of identity and discrepancy:

b2a. it is said: "whereof one is the same with a third and the other i discrepant from it, are diverse from each other",

b2b. not "which are discrepant from one third, are diverse from each other":

b2b1. For in this case:

b2b1a. there would be no comparison of the two with each other;

b2b1b. wherefore nothing would follow.

b2b2. Thus:

b2b2a. not valid is this:

'An Englishman is not a Chinaman.
An Englishman is not an Italian.
Therefore no Italian is a Chinaman'.

b2b2b. nor valid is this:

'An Englishman is not a Chinaman.
An Englishman is not an Asiatic.
Therefore no Asiatic is a Chinaman'.

B. But from the notion of the syllogism through its property (n.255,A) there follows another principle which applies the first, and in which is mo directly considered the extension of the terms.

a. This principle is called the PRINCIPLE OF THE SAID ABOUT EVERY OF THE SAID ABOUT NO, which is thus formulated:

a1. with regard to the said about every (dictum de omni): WHATEVER IS UNIVERSALLY AFFIRMED OF SOME SUBJECT, MUST BE AFFIRMED OF ALL CONTAINED BENEATH IT;

a2. with regard to the said about no (dictum de nullo): WHATEVER IS UNIVERSALLY DENIED OF SOME SUBJECT, IS SAID OF NO ONE OF THOSE WHICH ARE CONTAINED BENEATH IT.

b. This principle is self-evident (per se notum): for it immediately follows from the proper character of the universal which is predicable of its subjects.

b1. For:

b1a. 'mortal' declared identical with 'man', may be declared identical with 'Peter' by means of this third term 'man', only because the universal 'man', which is one in the mind, is identified in the real with each human being, and [illegible] 'Peter'.

b1b. Consequently, what is affirmed of 'man' must also be affirmed of each individual man. (Cf. Anal. Prior, I, 1, 24b, 26).

b2. Note accordingly that it pertains to the essence of the syllogism properly so-called (we are not speaking of the expository syllogism, which, as will be explained later, is a syllogism only improperly so-called) that M be a universal object of a concept:

b2a. For inasmuch as M is the cause or reason of the attribution of P to S, it must itself be communicable to S: but to be communicable to many is to be universal.

b2b. Therefore "the principle of the syllogism resides in the universal nature" (Maritain: Introd. to Logic, p.178).

258. VALUE OF THE PRINCIPLE 'NOTA NOTAE': MANY MODERN WRITERS, such as Lachelier (Etudes sur le Syllogisme), following KANT (Uber die falsche Spitzfindigkeit der 4 syll., pp.32ss), substitute for the principle of the SAID ABOUT EVERY, of the SAID ABOUT NONE, another principle:

A. Which is this: "A NOTE OF A NOTE IS A NOTE OF THE THING ITSELF, WHAT IS REPUGNANT TO A NOTE IS REPUGNANT TO THE THING ITSELF - NOTA NOTAE EST NOTA REI IPSIUS, REPUGNANS NOTAE REPUGNANT REI IPSI".

a. Thus in the syllogism:

'Every man is mortal.
But Peter is a man.
Therefore Peter is mortal';

b. the note 'mortal':

b1. which enters into the comprehension of the note 'man' (i.e. is a note of the note 'man').

b2. also enters into the comprehension of the subject (thing) 'Peter' which possesses the note 'man' (i.e. also is a note of the thing itself 'Peter').

B. The REASON which they urge for this substitution is that:

a. they think that the principle of the 'said of every' (dictum de omni) considers only the extension of concepts,

b. and they prefer to it a principle based solely on the comprehension of concepts.

C. But AGAINST THIS INNOVATION it must be said:

a. That, although this principle is TRUE;

b. Yet it is INSUFFICIENT or INADEQUATE, because:

b1. It does not tell the reason why a note of a note is a note of the thing itself, v.g. why the note 'mortal' which belongs to 'man' must also belong to the subject 'Peter'.

b1a. The reason indeed is the universal nature: for, from the very notion of the universal, whatever is affirmed of 'man' must also be affirmed of all the subjects wherein the nature 'man' is realized.

b1b. Wherefrom it appears that the very principle 'nota notae' supposes the principle of the 'said of every' (dictum de omni). (Cf. T. Richard: Philosophie du raisonnement dans la Science, ch.6).

b2. Moreover the principle 'nota notae' does not tell the essential condition of the syllogism, which is that M must be taken universally at least in one proposition.

b2a. Thus the principle 'nota notae' taken alone might allow it to be thought that this syllogism is valid:

'Some man is cruel.
But Peter is a man.
Therefore Peter is cruel'.

b2b. But it is from the extension of terms that it is seen that this argument is invalid:

b2b1. for M is taken particularly in both premisses (cf. n.71, B.a).

b2b2. But to appeal to extension is to appeal, at least implicitly, to the principle of the 'said of every' (dictum de omni).

b3. Further, the principle 'nota notae' avails only for syllogisms of the first figure (cf. infra, Art.4).

b3a. Therefore for syllogisms of the other figures, other principles would have to be adopted.

b3b. Wherefrom it follows that the principle 'nota notae' is not the supreme principle of the syllogism.

b4. For the rest, not true is what those writers say, namely, that the principle of the 'said of every' (dictum de omni) is based SOLELY on extension:

b4a. For it is based on the VERY NATURE of the universal which is communicable;

b4b. and does not consider extension alone:

b4b1. for the extension of a universal is a property which presupposes its comprehension (n.46);

b4b2. and what the principle of the 'said of every' (dictum de omni) does directly consider is the communicability of the universal to the subjects in which it is realized.

……

ARTICLE THREE.

LAWS OF THE CATEGORICAL SYLLOGISM.

259. THE LAWS: It is question here of the laws whereby the supreme principle of the categorical syllogism (to wit: THOSE WHICH ARE THE SAME WITH ONE THIRD ARE ALSO THE SAME WITH EACH OTHER; AND THOSE WHEREOF ONE IS THE SAME WITH A THIRD AND THE OTHER IS DISCREPANT FROM IT, ARE DIVERSE FROM EACH OTHER), is applied; and which accordingly tell the procedure which must be followed in order that this supreme principle may be applied.

A. FOUR LAWS CONCERN TERMS, to wit:
a. First law: LET THERE BE THREE TERMS ONLY: MAJOR, MIDDLE AND MINOR.
b. Second law: THE TERMS MUST NEVER BE BROADER IN THE CONCLUSION THAN IN THE PREMISSES.
c. Third law: THE MIDDLE TERM MUST NEVER ENTER INTO THE CONCLUSION.
d. Fourth law: THE MIDDLE TERM MUST BE UNIVERSAL AT LEAST ONCE.

B. AND FOUR LAWS CONCERN PROPOSITIONS, to wit:
a. Fifth law: FROM TWO NEGATIVE PREMISSES NOTHING FOLLOWS.
b. Sixth law: WHEN BOTH THE PREMISSES ARE AFFIRMATIVE, THE CONCLUSION MUST NOT BE NEGATIVE.
c. Seventh law: THE CONCLUSION ALWAYS FOLLOWS THE WORSE PART (cf. n.249).
d. Eighth law: FROM TWO PARTICULARS NOTHING FOLLOWS.

260. LAWS FOLLOWING FROM THE FIRST PART OF THE SUPREME PRINCIPLE: From the first part of the supreme principle (to wit: THOSE WHICH ARE THE SAME WITH ONE THIRD ARE ALSO THE SAME WITH EACH OTHER) follow four of the above-stated laws:

A. LET THERE BE THREE TERMS ONLY, MAJOR, MIDDLE AND MINOR (first law).
a. It is an offence against this law to use M:
a1. with diverse signification (cf. nn.62-64),
a2. or with diverse supposition (n.70).

b. Likewise to use an extreme in the conclusion with a greater extension than in the premisses: wherefore THE TERMS MUST NEVER BE BROADER IN THE CONCLUSION THAN IN THE PREMISSES (second law).

c. Likewise if M is twice taken particularly: wherefore THE MIDDLE TERM MUST BE UNIVERSAL AT LEAST ONCE (fourth law).

B. WHEN BOTH THE PREMISSES ARE AFFIRMATIVE, THE CONCLUSION MUST NOT BE NEGATIVE (sixth law).

261. LAW FOLLOWING FROM THE SECOND PART OF THE SUPREME PRINCIPLE: From the second part of the supreme principle (to wit, THOSE WHEREOF ONE IS THE SAME WITH A THIRD AND THE OTHER IS DISCREPANT FROM IT, ARE DIVERSE FROM EACH OTHER) follows another of the above-stated laws, to wit: FROM TWO NEGATIVE PREMISSES NOTHING FOLLOWS (fifth law).

262. LAWS FOLLOWING FROM THE TWO PARTS TAKEN TOGETHER: From both parts taken together of the supreme principle follow the remaining three above-stated laws:

A. THE MIDDLE TERM MUST NEVER ENTER INTO THE CONCLUSION (third law).

B. THE CONCLUSION ALWAYS FOLLOWS THE WORSE PART (seventh law).

a. For if one premiss is particular, the conclusion must be particular on account of the second law (or on account of the first part of the supreme principle).

b. But if one premiss is negative, the conclusion must be negative on account of the second part of the supreme principle.

C. FROM TWO PARTICULARS NOTHING FOLLOWS (eighth law).

a. If both premisses are affirmative, all the terms have particular supposition (n.71, B), and therefore the syllogism offends against the fourth law (or against the first part of the supreme principle).

b. If both premisses are negative the syllogism offends against the fifth law (or against the second part of the supreme principle).

c. If one premiss is affirmative and the other negative, the syllogism offends against the second law (or against the first part of the supreme principle):

c1. for in this case, there is only one universal term,

c2. whereas there must be two universal terms, of which:

c2a. one is M,

c2b. and one is P of a negative conclusion (n.71,B), - for if one premiss is negative the conclusion must be negative (B.b).

263. EXAMPLES OF VIOLATIONS OF THESE LAWS: These laws may be illustrated from violations - which accordingly are violations of the SUPREME PRINCIPLE of the syllogism.

A. Examples of violations of the FIRST LAW: THERE MUST BE THREE TERMS, AND THREE ONLY: MAJOR, MIDDLE AND MINOR.

a. Example:

'Dogs and cats are English words. (MATERIAL SUPPOSITION).
But English words do not eat meat.
Therefore dogs and cats do not eat meat'. (FORMAL SUPPOSITION).

b. But let us take:

b1. this example:

'One cat has one more tail than no cat.
But no cat has ninety-nine tails.
Therefore one cat has a hundred tails'.

b2. This argument AS IT STANDS:

b2a. violates the seventh law, since it deduces an affirmative conclusion from premisses whereof one is negative.

b2b. and puts the major after the minor: for the premiss which contains S of the conclusion is the minor.

b2c. and appears to have five terms: to wit:

b2c1. 'one cat', which occurs twice.

b2c2. 'having one more tail than no cat', which occurs once only.

b2c3. 'no cat', which occurs once only.

b2c4. 'having ninety-nine tails', which occurs once only.

b2c5. 'having a hundred tails', which occurs once only.

b3. Accordingly, emending this argument so as to eliminate these defects, we get this:

	M 'That which is having one more tail than no cat is having .... (Here 'NO CAT' is a FINITE TERM, which is S of a negative proposition.)	is	P having a hundred tails, ... (since no cat is having ninety-nine tails.)
But	S one cat	is	M that which is having one more tail than no cat is having. .... (Here 'NO CAT' is an INFINITE TERM - 'non-cat' - , which is S of an affirmative proposition).
Therefore	S one cat	is	P having a hundred tails'.

b4. For note that:
b4a. Not the same are these propositions:
b4a1. 'No man is endowed with senses': which is NEGATIVE AND FALSE.
b4a2. 'Non-man is endowed with senses': which is AFFIRMATIVE AND TRUE.
b4b. And similarly, not the same are these propositions:
b4b1. 'NO CAT is having ninety-nine tails': which is NEGATIVE.
b4b2. 'NON-CAT is having ninety-nine tails': which is AFFIRMATIVE.

b5. Hence in the above argument there are four terms.

c. Let us take as a third example:
c1. The ontological argument for the existence of God, as proposed by St Anselm:

'God is that than which a greater cannot be thought of.
But that than which a greater cannot be thought of, exists.
Therefore God exists.'

c2. Here again there are four terms.
c2a. For 'exists' in the second proposition supposes for 'signified existence' or 'existence represented' or 'ideal existence': making the proposition this: 'But that than which a greater cannot be thought of, is thought of as existing'.
c2b. But 'exists' in the conclusion supposes for 'existence exercised'.

d. Let us take as a fourth example:
d1. The ontological proof for the existence of God as proposed by Descartes:

'A supremely perfect being exists.
But God is a supremely perfect being.
Therefore God exists.'

d2. Just as in the Anselmian formulation, so also here are four terms:
d2a. For in the premisses 'exists' supposes for 'signified be';
d2b. While in the conclusion 'exists' supposes for 'exercised be'.

B. Examples of violations of the SECOND LAW: THE TERMS MUST NEVER BE BROADER IN THE CONCLUSION THAN IN THE PREMISSES:

a. Let us take:
a1. this example:

Whatever falls under our senses exists.
But God does not fall under our senses.
Therefore God does not exist'.

a2. For here:
a2a. 'exists' in the major is particular (is 'some existing thing' (cf. n.71, B.a);
a2b. but 'exist' in the conclusion is universal (no existing thing) (cf. n.71, B.b).

b. Let us take:
b1. this example:

'Mind is endowed with activity.
But matter is not mind.
Therefore matter is not endowed with activity'.

b2. For here:
b2a. 'endowed with activity' in the major supposes particularly (cf. n.71, B.a).
b2b. but 'endowed with activity' in the minor supposes universally (cf. n.71, B.b).

C. Examples of violations of the THIRD LAW: THE MIDDLE TERM MUST NEVER ENTER INTO THE CONCLUSION:

a. Let us take this example:

'All Franciscans are poor.
But all Franciscans are worshippers of God.
Therefore all Franciscans are poor worshippers of God'.
(M ENTERS THE CONCLUSION).

b. Or this example:

'Every plant is a living thing.
But every animal is a living thing.
Therefore every living thing is a plant or an animal'.
(M ENTERS THE CONCLUSION).

D. Examples of violations of the FOURTH LAW: THE MIDDLE TERM MUST BE UNIVERSAL AT LEAST ONCE:

a. Let us take:
a1. this example:

'Jersey cows are producers of rich milk.
But good cows are producers of rich milk.
Therefore (all) good cows are Jersey cows'.

a2. Here M is not once taken universally (cf. n.71, B.a).

b. Or let us take:
b1. this example:

(Some 'Australians are good cricketers.
But the men in our regiment are Australians.
Therefore the men in our regiment are good cricketers'.

b2. Here M is not once taken universally (n.71, B.a).

c. Or let us take:
c1. this example:

'Some animal is a substance.
But some man is an animal.
Therefore some man is a substance'.

c2. Here:
c2a. similarly, M is not once taken universally (cf. n.71, B.a).
c2b. But the true conclusion follows from this that 'every animal is a substance'.

d. Or let us take:
d1. this example:

'Every great truth is difficult to understand.
But Kant's doctrine is difficult to understand.
Therefore Kant's doctrine is a great truth'.

d2. Here likewise M is not once taken universally (cf. n.71, B.a).

E. Examples of violations of the FIFTH LAW: FROM TWO NEGATIVE PREMISSES NOTHING FOLLOWS:

a. Let us take this example:

'The powerful are NOT merciful. (NEGATIVE).
But the poor are NOT powerful. (NEGATIVE).
Therefore the poor are merciful'.

b. But let us consider:
b1. this argument:

'No non-living thing is mortal.
But no rock is a living thing.
Therefore no rock is mortal'.

b2. This syllogism rightly concludes: for:
b2a. though in appearance the two premisses are negative,
b2b. in reality the second proposition is affirmative:
b2b1. for the middle term is really 'non-living thing',
b2b2. so that the second proposition is really this: 'every rock is a non-living thing'.

F. Examples of violations of the SIXTH LAW: WHEN THE PREMISSES ARE AFFIRMATIVE, THE CONCLUSION MUST NOT BE NEGATIVE.

a. Let us take:
a1. this example:

'Every insensitive thing is passionless. (AFFIRMATIVE)
But every non-living body is insensitive. (AFFIRMATIVE).
Therefore no living body is passionless.' (NEGATIVE).

a2. For:
a2a. the conclusion ought to be: 'every non-living body is passionless' - which is AFFIRMATIVE, and also TRUE;
a2b. whereas the third proposition above is FALSE, for plants are living bodies, but passionless.

b. But let us consider:
b1. this argument:

'Every sensitive being is different from a plant.
But a mosquito is a sensitive being.
Therefore a mosquito is not a plant'.

b2. This syllogism rightly concludes:
b2a. for 'is different from' in the major is equivalent to 'is not';
b2b. wherefore the major is really negative.

G. Examples of violations of the SEVENTH LAW: THE CONCLUSION ALWAYS FOLLOWS THE WORSE PART:

a. Let us take this example:

'Every violation of charity ought to be avoided.	(UNIVERSAL).
But some severity is a violation of charity.	(PARTICULAR).
Therefore every severity ought to be avoided'.	(UNIVERSAL).

b. But let us consider:
b1. this argument:

'Every animal is a living thing.
But some animal is not a man.
Therefore some non-man is a living thing'.

b2. This argument rightly concludes:
b2a. because the minor is equivalent to: 'some animal is a non-man':
b2b. which is affirmative.

H. Example of violation of the EIGHTH LAW: FROM TWO PARTICULARS NOTHING FOLLOWS:

'Some avaricious people are rogues.	(PARTICULAR).
But some politicians are avaricious.	(PARTICULAR).
Therefore some politicians are rogues'.	

264. REDUCTION OF THESE LAWS TO THREE: These eight laws may be reduced to three, so that IN PRACTICE the eight laws are observed WHEN TOGETHER:

A. First: S and P of the conclusion have the same SIGNIFICATION and SUPPOSITION as in the premisses.

B. Secondly: M is at least once universal.

C. Thirdly: The conclusion:
a. from affirmative premisses is affirmative,
b. from diverse premisses is negative,
c. from negative premisses is not drawn at all.

……………………………………………

ARTICLE FOUR.

FORMS OF CATEGORIC SYLLOGISM.

265. DIVERSE CONSIDERATIONS OF THE FORM OF THE SYLLOGISM: As said above (nn.245-246), the syllogism consists of a MATTER and a FORM.

A. But, as we have seen earlier (n.245), the matter of the syllogism is distinguished into:
a. the REMOTE matter, which is the CONCEPTS (or TERMS);
b. and the PROXIMATE matter, which is the PROPOSITIONS.

B. Accordingly, the form of the syllogism is correspondingly distinguished according as it is:
a. either a disposition of the remote matter or concepts: and thus taken the form of the syllogism is called its FIGURE:
b. or a disposition of the proximate matter or propositions: and thus taken the form of the syllogism is called its MOOD.

266. FIGURES OF THE SYLLOGISM: "Figure properly is found is mathematical (beings), but transumptively in the syllogism, and this after the likeness of a triangular figure: for just as a triangle is a closing of three lines at three angles, so a syllogism is the concurrence of three propositions, to wit, major, minor and conclusion, in three terms." (De Natura Syllogismorum - a work spuriously attributed to St Thomas).

A. Accordingly, the FIGURE of a syllogism is:

a. the ORDER OR DISPOSITION OF THE EXTREMES WITH THE MEDIUM BY WAY OF PREDICATE AND SUBJECT,
b. or the ARTIFICIAL DISPOSITION OF THE REMOTE MATTER OF THE SYLLOGISM.

B. This disposition or order is FOURFOLD:

a. Thus:

(1) M......P	(2) P......M	(3) P......M	(4) M......P
S......M	M......S	S......M	M......S
S......P	S......P	S......P	S......P

b. "If the medium in one proposition is subjected and in the other is predicated, it is said to be the FIRST FIGURE;
b1. "and rightly, because then the medium is truly a mean, because it savours of the nature of each extreme, to wit, of subject and predicate." (Summa Totius Logicae: Tract. VIII, c.4: note that this work was spuriously attributed to St Thomas).
b2. This is the case in (1) and (2) above.

c. "But if the medium in both propositions is predicated, it is said to be the SECOND FIGURE;
c1. "because:
c1a. "although the medium is not truly a mean, savouring of the nature of subjectibility and of predication,
c1b. "nevertheless:
c1b1. "since to be predicated is more noble than to be subjected,
c1b2. "therefore this figure occupies second place." (Op.cit. ibid).
c2. This is the case in (3) above.

d. "But if the medium in both propositions is subjected, it is said to be the THIRD FIGURE, and it is the last:
d1. "because in it the medium:
d1a. "does not stand in the middle as in the first,
d1b. "but is subjected always, which is less noble." (ibid).
d2. This is the case in (4) above.

e. IT IS TO BE NOTED:
e1. that:
e1a. in two ways may the medium savour of both extremes: as is seen from (1) and (2) above;
e1b. and for this reason modern writers admit four figures.
e1c. But in reality (2) is not specifically distinct from (1) unless attention be paid to the signs only and not to the concepts. Hence in reality (2) is nothing other than (1) indirect.
e2. Let us take a syllogism of the first figure (1):
e2a. thus:

'Every MAN is mortal.
But Peter is a MAN.
Therefore Peter is mortal.'

e2b. Now:
e2b1. by:
e2b1a. the exchange of the minor and the major,
e2b1b. and the conversion of the conclusion.
e2b2. is obtained the following syllogism in (2).

'Peter is a MAN.
But MAN is mortal.
Therefore some mortal is Peter'.

e3. OBSERVE the necessity of converting the conclusion:
e3a. For if the conclusion remained 'therefore Peter is mortal', the syllogism would be a syllogism of the first figure (1) in which the major premiss would be placed second and the minor premiss placed first; (for remember that the major premiss is that premiss which contains P of the conclusion).

e3b. But:

e3b1. when the conversion has been made:

e3b1a. the MAJOR ('Peter is a man') is put first, and the MINOR ('man is mortal') is put second;

e3b1b. but in the CONCLUSION there is had INDIRECT PREDICATION (n.228, C): for P is inferior to S.

e3b2. And figure (2) differs from figure (1) in this only, that the conclusion is INDIRECT.

e3c. For which reason this figure (2) is better called the FIRST FIGURE INDIRECT; inasmuch as it is indeed the first figure but as concluding indirectly (i.e. with indirect predication).

e4. And indeed:

e4a. this figure was first proposed by Galen (a.d. 131-200), wherefrom it is called the GALENIC figure;

e4b. and is called by modern writers the FOURTH FIGURE, enumerating it after the three ARISTOTELIC figures.

e4c. But by Aristotle and the mediaeval logicians it was rejected AS A DISTINCT FIGURE, since it is:

e4c1. merely grammatically a distinct figure,

e4c2. but is not logically a distinct figure: because only by reason of its conclusion does it differ from the first figure, and even in the conclusion only grammatically, because logically, (or according to the relations of thought), its grammatical predicate is the logical subject (v.g. 'Peter', though grammatically the predicate, is logically the subject).

e4d. Wherefore to regard it as a distinct figure is to consider only the signs or words, and not the concepts or thought, in accordance with the tendency of many writers, especially among the moderns, to constitute a "logic of words" in place of the logic of thought, or, in other words, to reduce logic to grammar.

c. Wherefore the FIGURES of the syllogism are thus exhibited:-

FIGURES OF THE SYLLOGISM			
FIRST FIGURE		SECOND FIGURE	THIRD FIGURE
Direct	Indirect		
M.....P	P.....M	P.....M	M.....P
S.....M	M.....S	S.....M	M.....S
S.....P	S.....P	S.....P	S.....P
where M is FIRST SUBJECT, THEN PREDICATE	where M is FIRST PREDICATE, THEN SUBJECT	where M is TWICE PREDICATE	where M is TWICE SUBJECT

267. MOODS OF THE SYLLOGISM: Since the mood of a syllogism is the order or disposition of its proximate matter, or propositions:

A. The MOOD of a syllogism is the DISPOSITION OF THE PROPOSITIONS OF THE SYLLOGISM ACCORDING TO QUALITY AND QUANTITY.

B. MOODS OF THE FIRST FIGURE DIRECT:

a. To determine the diverse moods of the syllogism of the first figure along with the rules to which they are subject, let us take some examples:

MAJORS
A.....'Every MAN is mortal'.
E.....'No MAN is mortal'.
I.....'Some MAN is mortal'.
O.....'Some MAN is not mortal'.

MINORS
A.....'Every living thing is a MAN'.
E.....'No living thing is a MAN'.
I.....'Some living thing is a MAN'.
O.....'Some living thing is not a MAN'.

CONCLUSIONS
A.....'Every living thing is mortal'.
E.....'No living thing is mortal'
I.....'Some living thing is mortal'.
O.....'Some living thing is not mortal'.

b. Syllogisms in this FIRST FIGURE DIRECT rightly concluding:
b1. are these four:
b1a. AAA,
b1b. EAE,
b1c. AII,
b1d. EIO.

b2. For in these syllogisms all three laws stated above (n.264) are observed; since:

b2a. S and P of the conclusion have the same signification and the same (or less) supposition as in the premisses; (n.264, A); for:
b2a1. in the conclusion of AAA, S is universal and P is particular;
b2a1. in the conclusion of EAE, S is universal and P is universal;
b2a3. in the conclusion of AEE, S is particular and P is particular;
b2a4. in the conclusion of EIO, S is particular and P is universal.
b2b. M in all is once universal (n.264, B).
b2c. And the conclusion (n.264, C):
b2c1. from affirmative premisses is affirmative (in AAA and AII),
b2c2. from diverse premisses is negative (in EAE and EIO).

c. But it is otherwise with syllogisms in this figure whose MAJOR IS PARTICULAR, or whose MINOR IS NEGATIVE: for they do not conclude.

c1. If the MAJOR is PARTICULAR:

c1a. Either it is affirmative, and then the minor is either affirmative or negative:
c1a1. if the minor is affirmative, then M is twice particular;
c1a2. if the minor is negative, then P of the conclusion must be universal (as P of a negative proposition: n.71, B.b): but in an affirmative major P is always particular: so that P in the conclusion would have a greater supposition than in the premisses.

c1b. Or it is negative, and then the minor must be affirmative (since there is no conclusion from two negatives): but if the minor is affirmative, then M is twice particular.

c2. If the MINOR is NEGATIVE:
c2a. Then:
c2a1. the major must be affirmative, since from two negatives there is no conclusion,
c2a2. and the conclusion must be negative, since the premisses will be diverse.
c2b. But of a negative conclusion P is universal (cf. n.71, B.b).
c2c. But in the affirmative major P is particular (cf. n.71, B.a).

d. Wherefrom is gathered THIS RULE FOR MOODS OF THE FIRST FIGURE DIRECT:
d1. THE MINOR MUST BE AFFIRMATIVE,
d2. AND THE MAJOR MUST BE NOT PARTICULAR.

C. MOODS OF THE SECOND FIGURE:

a. Let us take some examples:

MAJORS

A.....'Every man is MORTAL'.
E.....'No man is MORTAL'.
I.....'Some man is MORTAL'.
O.....'Some man is not MORTAL'.

MINORS

A.....'Every living thing is MORTAL'.
E.....'No living thing is MORTAL'.
I.....'Some living thing is MORTAL'.
O.....'Some living thing is not MORTAL'.

CONCLUSIONS

A.....'Every living thing is a man'.
E.....'No living thing is a man'.
I.....'Some living thing is a man'.
O.....'Some living thing is not a man'.

b. Syllogisms in this SECOND FIGURE rightly concluding:
b1. are these four:
b1a. EAE,
b1b. AEE,
b1c. EIO,
b1d. AOO.

b2. For in these syllogisms all three laws stated above (n.264) are observed; since:

b2a. S and P of the conclusion have the same signification and the same (or less) supposition as in the premisses; (n.264, A): for:
b2a1. in the conclusion of EAE, S is universal and P is universal;
b2a2. in the conclusion of AEE, S is universal and P is universal;
b2a3. in the conclusion of EIO, S is particular and P is universal;
b2a4. in the conclusion of AOO, S is particular and P is universal.

b2b. M in all of them is once universal (n.264, B).

b2c. And in all of them the conclusion, as it ought to be, since the premisses in them all are diverse, is negative (n.264, C).

c. But it is otherwise with syllogisms in this figure whose MAJOR IS PARTICULAR, or whereof BOTH PREMISSES ARE AFFIRMATIVE, for they do not conclude.

c1. If the MAJOR is PARTICULAR:
c1a. Then P of the conclusion must be particular, for it cannot be of greater supposition than S of the major;
c1b. but then the conclusion must be affirmative: for if it were negative, its P would be universal (n.71, B.b).

c2. But if the conclusion is affirmative, then BOTH PREMISSES MUST BE AFFIRMATIVE (n.264, C); and then M is twice particular: which is against the law that M must be at least once universal (n.264, B).

d. Wherefrom is gathered THIS RULE OF THE MOODS OF THE SECOND FIGURE:
d1. ONE PREMISS MUST BE NEGATIVE.
d2. AND THE MAJOR MUST BE NOT PARTICULAR.

D. MOODS OF THE THIRD FIGURE:

a. Let us take some examples:

MAJORS

A.....'Every MAN is mortal'.
E.....'No MAN is mortal'.
I.....'Some MAN is mortal'.
O.....'Some MAN is not mortal'.

MINORS

A.....'Every MAN is a living thing'.
E.....'No MAN is a living thing'.
I.....'Some MAN is a living thing'.
O.....'Some MAN is not a living thing'.

CONCLUSIONS

A.....'Every living thing is mortal'.
E.....'No living thing is mortal'.
I.....'Some living thing is mortal'.
O.....'Some living thing is not mortal'.

b. Syllogisms in this THIRD FIGURE rightly concluding:

b1. are these six:

b1a. AAI,
b1b. EAO,
b1c. IAI,
b1d. AII,
b1e. OAO,
b1f. EIO.

b2. For in these syllogisms all three laws stated above (n.264) are observed; since:

b2a. S and P of the conclusion have the same signification and the same (or less) supposition as in the premisses; (n.264, A): for:

b2a1. in the conclusion of AAI, S is particular and P is particular;
b2a2. in the conclusion of EAO, S is particular and P is universal;
b2a3. in the conclusion of IAI, S is particular and P is particular;
b2a4. in the conclusion of AII, S is particular and P is particular:
b2a5. in the conclusion of OAO, S is particular and P is universal;
b2a6. in the conclusion of EIO, S is particular and P is universal.

b2b. M is in all of them at least once universal (n.264, B); (indeed in two of them, to wit, in AAI and in EAO, it is twice universal).

b2c. And the conclusion (n.264, C):

b2c1. from affirmative premisses is affirmative (in AAI, IAI and AII).
b2c2. from diverse premisses is negative (in EAO, OAO and EIO).

c. But it is otherwise with syllogisms in this figure whose MINOR IS NEGATIVE, or whose CONCLUSION IS UNIVERSAL: for they do not conclude.

c1. If the MINOR is NEGATIVE:

c1a. then the conclusion will be negative or there will be no conclusion (according as the major is affirmative or negative);

c1b. but if the conclusion is negative, then its P will be negative, and therefore universal;

c1c. but if P is universal in the conclusion, then it would have to be universal also in the major;

c1d. but the major, in order to have P universal, would have to be negative;

c1e. but then both premisses would be negative, and so there would be no conclusion.

c2. If the CONCLUSION is UNIVERSAL:

c2a. then its S must be universal;

c2b. but then P of the minor must be universal;

c2c. but this is impossible, since the minor must be affirmative, as just shown.

d. Wherefrom is gathered THIS RULE OF THE MOODS OF THE THIRD FIGURE:

d1. THE MINOR MUST BE AFFIRMATIVE,
d2. AND THE CONCLUSION MUST BE PARTICULAR.

E. MOODS OF THE FIRST FIGURE INDIRECT (GALENIC FIGURE):

a. Let us take some examples:

MAJORS

A.....'Every man is MORTAL'.
E.....'No man is MORTAL'.
I.....'Some man is MORTAL'.
O.....'Some man is not MORTAL'.

MINORS

A.....'Every MORTAL is a living thing'.
E.....'No MORTAL is a living thing'.
I.....'Some MORTAL is a living thing'.
O.....'Some MORTAL is not a living thing'.

CONCLUSIONS

A.....'Every living thing is a man'.
E.....'No living thing is a man'.
I.....'Some living thing is a man'.
O.....'Some living thing is not a man'.

b. Syllogisms in this INDIRECT FIGURE rightly concluding:

b1. are these five: (the second vowel here designates the major, the first vowel designates the minor).
b1a. AAI,
b1b. EAE,
b1c. AII,
b1d. AEO,
b1e. IEO.

b2. For in these syllogisms all three laws stated above (n.264) are observed; since:

b2a. S and P of the conclusion have the same signification and the same (or less) supposition as in the premisses; (n.264, A); for:
b2a1. in the conclusion of AAI, S is particular and P is particular;
b2a2. in the conclusion of EAE, S is universal and P is universal;
b2a3. in the conclusion of AII, S is particular and P is particular;
b2a4. in the conclusion of AEO, S is particular and P is universal;
b2a5. in the conclusion of IEO, S is particular and P is universal.

b2b. M in all of them is at least once universal; (indeed in one of them, to wit, in AEO, it is twice universal); (n.264, B).

b2c. And the conclusion (n.264, C):
b2c1. from affirmative premisses is affirmative (in AAI and AII),
b2c2. from diverse premisses is negative (in EAE, AEO and IEO).

c. But it is otherwise with syllogisms in this indirect figure whose PARTICULAR MAJOR IS NEGATIVE, or whose PARTICULAR MINOR IS NEGATIVE, or whose UNIVERSAL CONCLUSION IS AFFIRMATIVE: for they do not conclude.

c1. If the PARTICULAR MAJOR is NEGATIVE:
c1a. Then the conclusion will be negative;
c1b. therefore P of the conclusion will be universal;
c1c. but this same P in the major is only particular.

c2. If the PARTICULAR MINOR is NEGATIVE:
c2a. Then the major must be affirmative (for from two negatives there is no conclusion);
c2b. But then M will be twice particular (for it will be P of an affirmative major, and S of a particular minor).

c3. If the UNIVERSAL CONCLUSION is AFFIRMATIVE:
c3a. Then its S is universal.
c3b. But then this S is particular in the premisses, for it will be P of an affirmative minor, and therefore particular in that minor (n.71, B.a).

d. Wherefrom is gathered THIS RULE OF THE MOODS OF THE FIRST FIGURE INDIRECT OR GALENIC FIGURE:
d1. NEITHER THE MAJOR NOR THE MINOR CAN BE A PARTICULAR NEGATIVE,
d2. NOR CAN THE CONCLUSION BE A UNIVERSAL AFFIRMATIVE.

F. THEREFORE:

a. There are NINETEEN legitimate moods of the categoric syllogism; of which:
a1. four are in the first figure direct;
a2. five are in the first figure indirect (Galenic figure);
a3. four are in the second figure;
a4. six are in the third figure.

b. Those alone being legitimate:

b1. In the first figure direct, which observe this RULE:
b1a. THE MINOR MUST BE AFFIRMATIVE,
b1b. AND THE MAJOR CANNOT BE PARTICULAR.

b2. In the first figure indirect, which observe this RULE:
b2a. NEITHER THE MAJOR NOR THE MINOR CAN BE A PARTICULAR NEGATIVE,
b2b. NOR CAN THE CONCLUSION BE A UNIVERSAL AFFIRMATIVE.

b3. In the second figure, which observe this RULE:
b3a. ONE PREMISS MUST BE NEGATIVE,
b3b. AND THE MAJOR CANNOT BE PARTICULAR.

b4. In the third figure, which observe this RULE:
b4a. THE MINOR MUST BE AFFIRMATIVE,
b4b. AND THE CONCLUSION MUST BE PARTICULAR.

c. Which:
c1. is thus schematized:-

- The NINETEEN legitimate MOODS of the categoric syllogism
  - Of the FIRST FIGURE DIRECT
    - which is M...P
S...M
S...P ....
    - whose rule is. The minor must be affirmative, and the major cannot be particular.
    - AAA..........bArbArA
    - EAE..........cElArEnt
    - AII..........dArII
    - EIO..........fErIO
  - Of the FIRST FIGURE INDIRECT
    - which is P...M
M...S
S...P ....
    - whose rule is: Neither the major nor the minor can be a particular negative, nor can the conclusion be a universal affirmative.
    - AAI..........bArAlIp(ton)
    - EAE..........cElAntEs
    - AII..........dAbItIs
    - AEO..........fApEsmO
    - IEO..........frIsEsOm(orum)
  - Of the SECOND FIGURE
    - which is P...M
S...M
S...P ....
    - whose rule is: One premiss must be negative, and the major cannot be particular.
    - EAE..........cEsArE
    - AEE..........cAmEstrEs
    - EIO..........fEstInO
    - AOO..........bArOcO
  - of the THIRD FIGURE
    - which is M...P
M...S
S...P ....
    - whose rule is: The minor must be affirmative, and the conclusion must be particular.
    - AAI..........dArAptI
    - EAO..........fEIAptOn
    - IAI..........dIsAmIs
    - AII..........dAtIsI
    - OAO..........bOcArdO
    - EIO..........fErIsOn

c2. Regarding which schematic exhibition, NOTE:

c2a. That on the right-hand side are given the mnemonic designations of the respective moods: in these mnemonic words, the first three vowels are to be taken.

c2b. That these first three vowels:

c2b1. represent respectively the MAJOR, MINOR and CONCLUSION,

c2b2. except in the first figure indirect, where they represent respectively the MINOR, MAJOR and CONCLUSION, - this exception being due to this, that the major and minor of the first indirect figure are got by merely exchanging the major and minor of the first direct figure (cf. 266, A. c2).

268. EXAMPLES OF THE LEGITIMATE MOODS: It may be helpful to give here an example of each of the legitimate moods. But note that in each example: M is printed in capital letters; P is underlined.

A. EXAMPLES OF THE MOODS OF THE FIRST FIGURE DIRECT:

a. Which FIGURE is:

M.....P
S.....M
S.....P

b. EXAMPLE OF:

b1. bArbArA: Every	PROXIMATE PRINCIPLE OF OPERATION	is	specified from its formal object.	...A
But every	operative habit	is	a PROXIMATE PRINCIPLE OF OPERATION.	...A
Therefore every	operative habit	is	specified from its formal object.	A

b2. cElArEnt: No	MAN	is	a hater of himself	...E
But every	maniac	is	a MAN.	...A
Therefore no	maniac	is	a hater of himself.	...E

b3 dArII: Everything	HARMFUL TO PUBLIC MORALS	(is	due) ought to be suppressed.	...A
But some	publications	are	HARMFUL TO PUBLIC MORALS.	...I
Therefore some	publications	(are	due) ought to be suppressed.	...I

b4. fErIO: Nothing	WHOSE SUPPRESSION WOULD ENTAIL MORE HARM THAN ITS TOLERATION	(is	due) ought to be suppressed.	...E
But some	pernicious publications	are	such that THEIR SUPPRESSION WOULD ENTAIL MORE HARM THAN THEIR TOLERATION.	...I
Therefore some	pernicious publications	(are not	due) ought not to be suppressed.	...O

B. EXAMPLES OF THE MOODS OF THE FIRST FIGURE INDIRECT:

a. Which FIGURE is:

P.....M
M.....S
S.....P

b. EXAMPLE OF:

b1. bArAlIp(ton): Every	pea-rifle	is	a (weapon) APT TO GO OFF ACCIDENTALLY.	.A
But every	weapon APT TO GO OFF ACCIDENTALLY	is	a dangerous plaything.	.
Therefore some	dangerous plaything	is	a pea-rifle.	.I

b2. cElAntEs: Every	criminal	is	a MENACE TO THE PUBLIC GOOD.	.......A
But no	one who is a MENACE TO THE PUBLIC GOOD.	(is	due) ought to go unpunished.	.......E
Therefore no	(due) who ought to go unpunished	is	a criminal.	.......E

b3. dAbItIs: SOME	lunatics	are	QUITE HARMLESS.	I
But every	QUITE HARMLESS person	(is	due) ought to be left at liberty.	..........A
Therefore some	who ought to be left at liberty	are	lunatics.	I

b4. fApEsmO: No	good administrator	(is	SACRIFICING) sacrifices THE END FOR THE MEANS.	.......E
But every	one WHO SACRIFICES THE END FOR THE MEANS	is	foolish.	.......A
Therefore some	foolish being	is not	a good administrator.	.......O

b5. frIsEsOm(orum): No	genuine philosopher	(is	MAKING) makes ABSURD ASSERTIONS.	...E
But some	WHO MAKE ABSURD ASSERTIONS	(are	writing) write cleverly on philosophical questions.	...I
Therefore some	who write cleverly on philosophical questions	are not	genuine philosophers.	...O

C. EXAMPLES OF THE MOODS OF THE SECOND FIGURE:

a. Which FIGURE is:

P...M
S...M
S...P

b. EXAMPLE OF:

b1. cEsArE: No	thing endowed with intellect	is	DEVOID OF UNIVERSAL CONCEPTS.	......E
But every	thing which lacks speech	is	DEVOID OF UNIVERSAL CONCEPTS.	......A
Therefore no	thing which lacks speech	is	endowed with intellect.	......E

b2. cAmEsTrEs: Every	arrogant person	is	GRAVELY DEFICIENT IN PRUDENCE, HUMILITY AND CHARITY.	...A
But no	saint	is	GRAVELY DEFICIENT IN PRUDENCE, HUMILITY AND CHARITY.	...E
Therefore no	saint	is	arrogant.	...E

b3. fEstInO: No	great scholar	is	LACKING IN MODESTY.	..............E
But some	pretended scholars	are	LACKING IN MODESTY.	I
Therefore some	pretended scholars	are not	great scholars.	..............O

b4. bArOcO: Every	great philosopher	is	a THINKER WITH A PROFOUND RESPECT FOR THE PRINCIPLES OF REASON	........A
But some	philosophers	are not	THINKERS WITH A PROFOUND RESPECT FOR THE PRINCIPLES OF REASON.	........O
Therefore some	philosophers	are not	great philosophers.	........O

D. EXAMPLES OF THE MOODS OF THE THIRD FIGURE:

a. Which FIGURE is:

M.....P
M.....S
S.....P

b. EXAMPLE OF:

b1. dArAptI: Every GOVERNMENT is liable to fail from its duty. ....A

But every GOVERNMENT is bound to protect the public good from its enemies. ....A

Therefore some who are bound to protect the public good from its enemies are liable to fail from their duty. I

b2. fElAptOn: No GRAVE THREAT TO THE PUBLIC GOOD is removed by mere apathy. ....E

But every GRAVE THREAT TO THE PUBLIC GOOD is tolerated only with grave guilt. ....A

Therefore some thing which is tolerated only with grave guilt is not removed by mere apathy. ....O

b3. dIsAmIs: Some DIPLOMATS are rogues. I

But every DIPLOMAT is a man of high social standing. ......A

Therefore some men of high social standing are rogues. I

b4. dAtIsI: Every GREAT POET (is uttering) utters noble sentiments. ....A

But some GREAT POETS are men of ignoble character. I

Therefore some men of ignoble character (are uttering) utter noble sentiments. I

b5. bOcArdO: Some GREAT ATHLETE is not a patriot. ....O

But every GREAT ATHLETE is a popular hero. ....A

Therefore some popular hero is not a patriot. ....O b6. fErIsOn: No AVARICIOUS MAN (is able to) can be relied on to avoid dishonesty. ....E

But some AVARICIOUS MAN is a public personage. I

Therefore some public personage (is not able to) cannot be relied on to avoid dishonesty. ....O

....

ARTICLE FIVE.

REDUCTION OF THE MOODS OF THE CATEGORIC SYLLOGISM.

269. NECESSITY OF REDUCTION: The reduction of a syllogism is the REVOCATION OF A SYLLOGISM TO ITS REGULATIVE PRINCIPLES (i.e. to the 'dictum de omni' and the 'dictum de nullo').

A. For the moods of the FIRST FIGURE DIRECT are more perfect than the moods of the other figures:

a. For the moods of the FIRST FIGURE DIRECT are immediately regulated by the 'dictum de omni' and 'dictum de nullo':

a1. the reason of this is that in the FIRST FIGURE DIRECT:

a1a. the extension of the terms is in this order P>M>S: for that:

a1a1. of P is greater than of M,

a1a2. and of M is greater than of S;

a1b. which is manifested by the order of predication, inasmuch as:

a1b1. P is in both its appearances predicate,

a1b2. S is in both its appearances subject,

a1b3. M stands between those two as subject to P and as predicate to S.

a1c. Wherefore in these moods M manifests itself as a mean. (Cf. n.266.B.

b. But the moods of the OTHER FIGURES are only mediately regulated by the 'dictum de omni' and the 'dictum de nullo', by means of some particular determination:

b1. the reason of this is that:

b1a. in the second figure the extension of M is greater than of P and of P greater than of S; the order of extension being M>P>S;

b1b. and in the third figure the extension of P is greater than of S and of S greater than of M; the order of extension being P>S>M;

b1c. and in the first figure indirect the extension of S is greater than of M and of M greater than of P; the order of extension being S>M>P.

b2. Whence it follows that in these other figures the consequence does not so readily nor so clearly appear as in the first figure direct.

b3. For which reason:

b3a. the moods of the first figure are called PERFECT MOODS or perfect syllogisms,

b3b. while the moods of the other figures are called IMPERFECT MOODS or imperfect syllogisms.

B. Indeed:

a. Since in the second figure:

a1. the order of extension is M>P>S,

a2. the 'dictum de omni' and 'dictum de nullo' regulates the moods of this second figure only by the medium of this principle which is called the 'dictum de diverso': IF SOME ATTRIBUTE CAN BE PREDICATED AFFIRMATIVELY OR NEGATIVELY ABOUT SOME TERM, THERE IS NOT CONTAINED UNDER THAT TERM ANYTHING ABOUT WHICH THAT ATTRIBUTE CANNOT BE PREDICATED (AFFIRMATIVELY OR NEGATIVELY): which may be thus expressed:

a2a. if 'animal' can be affirmed of 'man', then 'man' cannot be affirmed of anything of which 'animal' cannot be affirmed: v.g. since 'animal' is affirmed of 'man', therefore 'man' cannot be affirmed of 'tree', since 'animal' cannot be affirmed of 'tree';

a2b. if 'fish' can be denied of 'man', then 'man' cannot be affirmed of anything of which 'fish' cannot be denied, v.g. 'trout'.

b. But since in the third figure:

b1. the order of extension is P-S-M,

b2. the 'dictum de omni' and 'dictum de nullo' regulates the moods of this third figure only by the medium of this principle which is called the 'dictum de parte': TWO TERMS, WHICH CONTAIN SOME COMMON PART, PARTLY AGREE; BUT IF ONE CONTAINS A PART, WHICH THE OTHER DOES NOT CONTAIN, THEY DIFFER PARTLY: which may be easily understood from two examples:

b2a. since 'rogue' and 'man of high social standing' (in the example given above: n.268, D.b3) both contain 'diplomat' (as inferiors), then according to that inferior, they agree with each other;

b2b. since 'popular hero' (in the example given above: n.268, D.b5) contains 'some athlete' (as an inferior) which 'patriot' does not contain (as an inferior), then according to that part (that inferior of 'popular hero'), 'patriot' and 'popular hero' do not agree.

C. Wherefore it is necessary to reduce the imperfect moods of the other figures to the perfect moods of the first figure:

a. in order that the application of the 'dictum de omni' and the 'dictum de nullo' may the more clearly appear;

b. and thus the consequence may the more clearly and readily appear.

270 TWO MODES OF REDUCTION: But this reduction is made in two ways:

A. By DIRECT or OSTENSIVE reduction, whereby is manifested by a syllogism of the first figure the same conclusion as in the imperfect syllogism.

a. This direct reduction is effected by two operations: to wit:

a1. by the conversion of one or the other of the propositions of the imperfect syllogism;

a2. and by the transposition of the major into the minor.

b. This direct reduction is possible for all the imperfect moods, except 'Baroco' and 'Bocardo' which are reduced only by reduction by the impossible (per impossibile').

B. By REDUCTION 'PER IMPOSSIBLE', which shows, by means of a syllogism of the first figure, that the conclusion of the imperfect syllogism cannot be denied while its premisses stand, without contradiction. Thus it is shown that the imperfect syllogism rightly concludes.

a. This reduction therefore supposes two things, to wit:

a1. the denial of the conclusion, which is supposed to be false;

a2. the acceptation of the premisses, which are conceded.

b. For which reason:

b1. the contradictory of the conclusion is formed, and substituted for one of the premisses;

b2. from the other premiss and the new proposition a syllogism of the first figure is made, whose conclusion is the contradictory of the omitted premiss - which had been conceded.

c. This reduction 'per impossible' is possible for all the imperfect moods; and indeed, as said above, 'Baroco' and 'Bocardo', are reducible in this way only.

271. PRACTICAL RULES OF REDUCTION: Practically, however, the operations to be performed for the reduction of the moods are indicated by certain consonants in the mnemonic words (Cesare, Camestres, etc).

A. The first letter of each imperfect mood which is found in the moods of the first figure (direct) indicates to which mood the reduction must be made:

a. Thus syllogisms in 'Dabitis' (first figure indirect), in 'Disamis' (third figure), and in 'Darapti' (third figure), are converted into a syllogism in 'Dari' (first figure direct).

b. Similarly, syllogisms in 'Baroco' and in 'Bocardo' are converted into 'Barbara'; and so on

B. The letter which in the imperfect moods follows the vowels indicating the propositions, indicates the operations to be performed, provided this letter is one of the following:

a. 's' signifies simple conversion. Thus 'ceSare', 'cameStreS'.

b. 'p' signifies accidental conversion (conversion 'per accidens'). Thus 'daraPti', 'felaPton'.

c. 'm' signifies the transposition (mutatio) of the major into the place of the minor, or vice versa. Thus 'disaMis', 'caMestres'.

d. 'c' indicates that reduction 'per impossible' is the only mode of reduction, and indicates for which premiss the contradiction of the conclusion is to be substituted. Thus 'baroCo', 'boCardo'.

C. Let us take some EXAMPLES:

a. Let us take:

a1. a syllogism of the second figure in 'CeSare':

CeS 'No man is a PLANT.
ar But every animal is a PLANT.
e Therefore no animal is a man'.

a2. Now:
a2a. 'C' signifies that this is to be converted into 'Celarent'.
a2b. 's' signifies that the major is to be converted simply.

a3. Therefore this syllogism is obtained:

Cel 'No PLant is a man.
ar But every animal is a PLANT.
ent Therefore no animal is a man'.

b. Let us take as a second example the conversion of a syllogism of the second figure in 'Camestres': which is more difficult:

b1. Let this be the syllogism:

CaM 'Every tree is a PLANT.
eStr But no man is a PLANT.
eS Therefore no man is a tree'.

b2. Now:
b2a. 'C' shows that the reduction is to be made into 'Celarent'.
b2b. 'm' shows that the major is to be transposed into the place of the minor.
b2c. 's' shows that the minor is to be converted simply.
b2d. 's' following the third vowel shows that the conclusion is to be converted simply.

b3. Therefore this syllogism is obtained:

Cel 'No PLANT is a man.
ar But every tree is a PLANT.
ent Therefore no tree is a man'.

c. Let the third example be that of a syllogism in 'Bocardo' (third figure):

c1. Let the syllogism be this:

BoC 'Some ANIMAL is not a stone.
ard But every ANIMAL is a living thing.
o Therefore some living thing is not a stone'.

c2. Now:
c2a. 'B' indicates that the reduction must be made into 'Barbara'.
c2b. 'c' indicates:
c2b1. that the reduction is 'per impossible';
c2b2. and that the contradictory of the conclusion is to be substituted for the major.

c2c. And then the conclusion of the syllogism in 'Barbara' will be the contradiction of the major of the syllogism in 'Bocardo'.

c3. Thus this syllogism is obtained:

Bar	'Every LIVING THING is a stone.
bar	But every animal is a LIVING THING.
a.	Therefore every animal is a stone'.

……………………………………

ARTICLE SIX.

VALUE OF THE SYLLOGISM AND OF ITS REDUCTION.

272. VALUE OF THE SYLLOGISM: The value of the syllogism is denied by many, especially by NOMINALISTS, who, identifying the universal with a collection of individuals (nn. 86, 89), logically say that the syllogism is either tautological or a vicious circle. Thus speak John Stuart Mill and Goblot.

A. For if this MAJOR: 'every man is mortal', signified: 'all men are mortal', because I have observed the death of each man contained in that collection, then indeed it would have to be said that the syllogism is tautological and a vicious circle.

a. TAUTOLOGICAL indeed, because the major would contain the conclusion actually (and not merely virtually). For I would not know that all men are mortal, if I did not know that Peter is mortal.

b. And at the same time a VICIOUS CIRCLE, for it follows therefrom that the truth of the conclusion is supposed by the major.

B. But in reality the syllogism is quite OTHERWISE:

a. True indeed it is that the syllogism LOGICALLY (i.e. if the logical relations be considered) concludes from a MORE UNIVERSAL to a LESS UNIVERSAL: in other words, it does pay attention to extension or to subjects (individuals).

a1. Nevertheless, as has been said above (n.255).
a1a. this consideration of the syllogism is a consideration of it according to a property,
a1b. and this reference to extension is only a required condition (conditio sine qua non) of its legitimacy.

a2. For:
a2a. I know that S and P are identified with each other,
a2b. only through knowing that each of them is identified with M;
a2c. but:
a2c1. I cannot know that P is identified with M unless I know that M is one of those that can receive the predication of P (i.e. that M is contained within the extension of P);
a2c2. and similarly I cannot know that S is identified with M unless I know that S is one of those that can receive the predication of M (i.e. that S is contained within the extension of M).
a2d. Therefore I cannot predicate P of S (i.e. identify S and P) UNLESS I know that M is contained within the extension of P and that S is contained within the extension of M;
a2e. Nevertheless, I predicate P of S, that is, IDENTIFY S and P:
a2e1. not because M is contained under the extension of P, and S is contained under the extension of M,
a2e2. but BECAUSE each of the two, to wit, each of S and P IS IDENTIFIED WITH THE SAME THIRD, to wit, with M.
a2f. Therefore:
a2f1. that consideration of the extension of the terms is a property of the syllogism, and indeed a required condition to the legitimacy of the syllogism, or, in other words, to the legitimacy of the IDENTIFICATION OF S AND P WITH EACH OTHER BY THE MEDIUM OF M, inasmuch as each of them is

identified with M;

a2f2. but it is NOT the essence of the syllogism, this ESSENCE consisting in the IDENTIFICATION OF S AND P WITH EACH OTHER BY THE MEDIUM OF M.

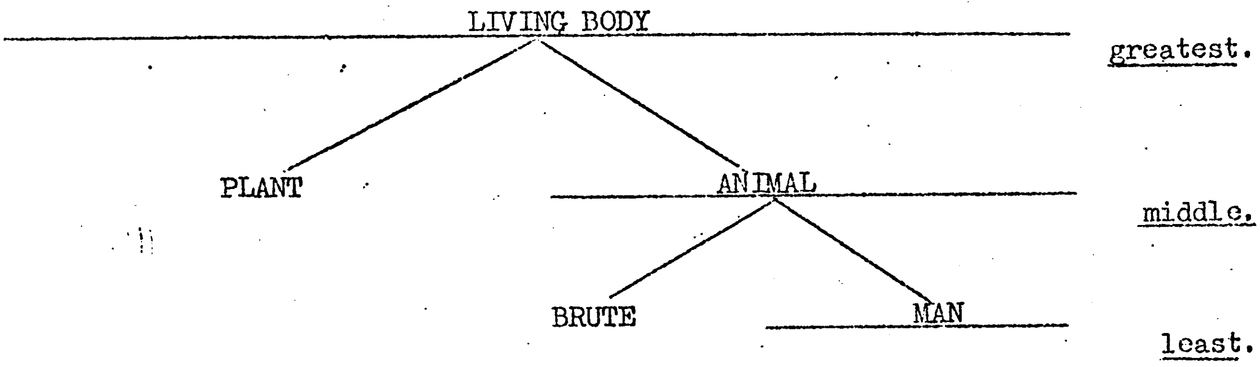
a3. Now it is to be explained why it is said that LOGICALLY considered the syllogism proceeds from a more universal to a less universal:

a3a. Let us take:

a3a1. this example, where the conclusion is less universal than the major:

'Animal is a living body. .....MORE UNIVERSAL.
But man is an animal.
Therefore man is a living body'. .....LESS UNIVERSAL.

a3a2. The extensions of the terms in this syllogism may be thus shown diagrammatically:-



a3b. But now let us take:

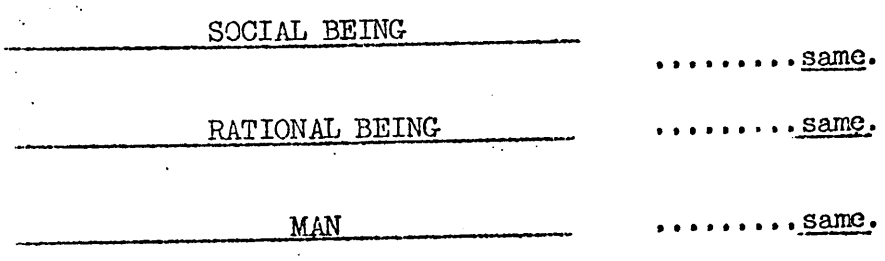
a3b1. this example:

'A rational being is a social being.
But man is a rational being.
Therefore man is a social being'.

a3b2. In this syllogism:

a3b2a. the conclusion is not less universal than the major, but is equally universal with it: for 'man' and 'rational animal' are of the same extension.

a3b2b. Accordingly, the extensions of the terms may be thus shown diagrammatically:-

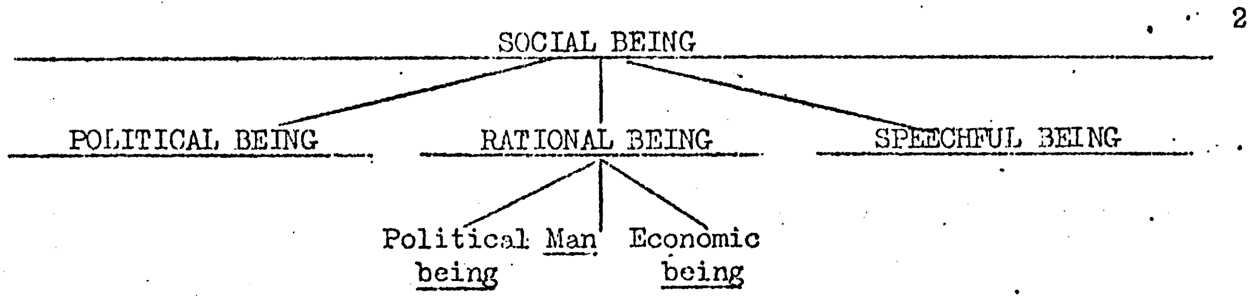


a3c. But:

a3c1. the extensions as thus shown are the REAL extensions; and WHEN REAL EXTENSIONS are considered, it must be said that this syllogism does not proceed from a more universal to a less universal, but proceeds from ONE UNIVERSAL TO ANOTHER UNIVERSAL, and indeed of the SAME universality.

a3c2. But nevertheless what was said above is true, namely, that LOGICALLY considered the syllogism proceeds from a MORE universal to a LESS universal: which is thus explained:

a3c2a. Let us diagrammatize the extensions of this same syllogism in another way:



a3c2b. Here:

a3c2b1. it clearly appears:

a3c2b1a. that M (rational being) is one of those that can receive the predication of P (social being), i.e. is contained within the extension of P;

a3c2b1b. and that S (man) is one of those that can receive the predication of M (rational being), i.e. is contained within the extension of M.

a3c2b2. And thus is exhibited the LOGICAL extensions of the terms, i.e. the extensions according to which these terms are related to each other AS THEY ARE RELATED TO EACH OTHER IN THE SYLLOGISM.

a3c2b3. And it is in this sense that the syllogism proceeds from the MORE universal ('a rational being is a social being') to the LESS universal ('man is a social being').

a3c2b4. But this DESCENT or procession from a more universal to a less universal:

a3c2b4a. pertains to the logical consideration of the syllogism,

a3c2b4b. and is a mere property (not the essence) of the syllogism.

a3d. And indeed:

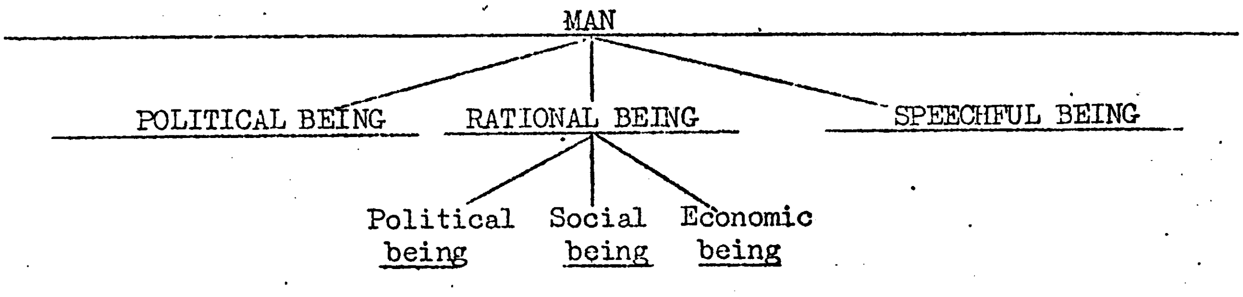
a3d1. to manifest more clearly this distinction between the REAL and the LOGICAL extensions of the terms of the syllogism, let us take this syllogism:

'Every rational being is man.
But every social being is a rational being.
Therefore every social being is man'.

a3d2. Here:

a3d2a. the three terms have the same REAL extension as they had in the previous syllogism, for they are the same terms;

a3d2b. but they have here DIVERSE - and even inverse - LOGICAL extensions AS TAKEN LOGICALLY must be diagrammatized thus:-



b. Hence it is clear that the syllogism, if attention be paid to the COMPREHENSION of the terms, or, - what amounts to the same, - to their REAL extension, does not always have the conclusion less universal than the premisses.

c. Accordingly, the ESSENCE of the syllogism lies in this, that S is united to P by the medium of M; or, in other words, that it passes a predicate (P) from one universal subject (M) to which it is attributed in the major - in syllogisms of the first figure, to which, for the rest, all syllogisms in other figures are reducible - to another universal subject (S) to which it is attributed in the conclusion, doing so through the further identification in the minor of S with the same M; which means that the syllogism proceeds from a UNIVERSAL TRUTH (in the major) to another UNIVERSAL truth (in the conclusion) - with indifference to whether this other universal truth be less universal (as in the example given earlier: a3a1) or equally universal (as in the examples given later: a3bl, a3dl).

c1. But a universal is not a collection of individuals or of subjects as has been shown above (nn.88-91):

c1a. and therefore to know that man is mortal (or that every man is mortal) is not formally the same as knowing that Peter and Paul and John and Caesar and Napoleon and Wellington and Pius XII and each of the whole collection of men, is mortal.

c1b. But a universal is a NATURE which contains subjects in potency only: for just as genus only potentially contains the species contained beneath it, (n.121, C.a), so also does species (v.g. 'man') only potentially contain individuals (v.g. 'Peter', 'Paul', 'Pius XII' etc).

c1c. For which reason it must be said:

c1c1. That to proceed from this truth: 'every man is mortal', to this truth: 'Peter is mortal', is to proceed to a NEW TRUTH (cf. n.242):

c1c1a. which was not (formally) known when the former truth was known,

c1c1b. and independently of which the former truth was known.

c1c2. That the major contains the conclusion:

c1c2a. not as a more universal proposition (formally known) contains a less universal proposition (formally known), i.e. actually implicitly,

c1c2b. but as a cause or principle contains its effect, i.e. virtually (cf. nn.241-242).

c2. THEREFORE:

c2a. The major:

c2a1. of the syllogism is:

c2a1a. not 'ALL MEN ARE mortal',

c2a1b. but 'EVERY MAN IS mortal';

c2a2. and the knowledge of its truth depends:

c2a2a. not upon knowing the death of all men,

c2a2b. but upon knowing the nature of man, which, since it consists of soul and body, bears within itself the character 'mortal'.

c2b. Wherefore the formula: 'all men are........ ':

c2b1. is less correct,

c2b2. although it can be understood in a legitimate sense, according as this is sub-understood: 'on account of man's nature'.

c2c. The difference:

c2c1. between these two formulas appears clearly from:

c2c1a. this example:

'ALL MEN ARE mortal.	....which may signify this: 'Peter is mortal and John is mortal and Caesar is mortal and Pius XII is mortal etc': in which case that major is NOT A UNIVERSAL truth, but is a mere collection of many singular truths.
But Peter is a man.	
Therefore Peter is mortal'	...which then is merely ONE OF THOSE MANY SINGULAR truths which was already known (formally) when the major was known, and is contained formally (or actually implicitly) in the major.

c2c1b. In which case the syllogism is (cf. A):

c2c1b1. merely tautological,

c2c1b2. and a vicious circle.

c2c2. and:

c2c2a. this example:

'EVERY MAN IS mortal.	...which signifies this: 'In whatsoever the nature (or block of reality) MAN is, in that the nature (or real character) MORTAL is': in which case that major is a UNIVERSAL truth.
But Peter is a man.	...which signifies this: 'But that nature (or block of reality) MAN is in Peter'.
Therefore Peter is mortal'	...which signifies this: 'Therefore in Peter is the nature (or real character) MORTAL'.

c2c2b. In which case:
c2c2b1. the major is known independently of any knowledge of the conclusion (or even of the minor).
c2c2b2. and the syllogism:
c2c2b2a. is neither tautological.
c2c2b2b. nor is a vicious circle.

d. Therefore:
d1. it is necessary carefully to distinguish from the syllogism:
d1a. such speeches:

d1a1. as this:

'ALL THE INHABITANTS OF town X perished in the tidal wave. ....which is not a universal truth, but a mere COLLECTION of many singular truths: and it cannot be known unless each of those singular truths is known: wherefore it formally (or actually implicitly) contains this truth: 'James perished in the tidal wave'.

But James was an inhbitant of town X.
Therefore James perished in the tidal wave'. ....which is not a conclusion: that is, it is known, not FROM, but IN, that first truth. (cf. n.241).

d1a2. and this:

'ALL THE APOSTLES were martyred. ....which is not a universal truth, but a mere COLLECTION of twelve singular truths: 'Peter was martyred' 'Andrew was martyred', 'Thomas was martyred' and so on.

But Andrew was an apostle.
Therefore Andrew was martyred'. ....which again is not a conclusion.

d1b. Such speeches as these:
d1b1. merely have the external appearance of the syllogism;
d1b2. and are employed "only that we may proceed to some sort of verification or sensible identification of a fact recorded in a proposition which presupposes it as known, but which we know only because we remember it or are told it by someone else" (Maritain: Introd. to Logic, p.211).
d1b3. "But, precisely in such cases there is neither reasoning nor inference, and no true logician has ever regarded them as valid examples of the syllogism" (Maritain: ibid.).

d1c. But a true syllogism is had in this example:.

'EVERY APOSTLE WAS commissioned by Christ to teach. ....which is UNIVERSAL.
But Andrew was an apostle.
Therefore Andrew was commissioned by Christ to teach'. ....which is a NEW TRUTH CONCLUDED.

d2. But many NOMINALISTIC writers, such as John Stuart Mill and Goblot:
d2a. misunderstanding the nature of the syllogism, think that those pseudo-syllogisms exemplified above (d1a) are true syllogisms, and that the syllogism is essentially of that kind;
d2b. wherefore logically - given that conception of the syllogism, or, in other words, given NOMINALISM - they say that the syllogism is either tautological or a vicious circle.

e. To complete the understanding of what has been said above, when it was said that it is of the ESSENCE of the syllogism to proceed from a UNIVERSAL to another UNIVERSAL (c):
e1. Note that in the syllogism every singular term is equivalent to a universal term, in this sense that it necessarily includes, without any further restriction, the whole extension of the subject which it signifies.

e1a. Thus 'Peter' is not restricted by the particularising particle 'some' to 'some Peter', but rather remains unrestricted like an unrestricted universal; and similarly 'Shakespeare' is not restricted to something less than its whole extension, but remains, as far as LOGICAL consideration of the syllogism is concerned, in the condition of an unrestricted universal.

e1b. For this reason:
e1b1. the proposition: 'Shakespeare is a poet' is an A-proposition:
e1b2. and this syllogism is in 'Barbara':

'Every great poet is a man of genius. ....A.
But Shakespeare is a great poet. ....A.
Therefore Shakespeare is a man of genius'. ....A.

e2. Wherefore if some syllogism proceeds to a SINGULAR truth;
e2a. this is accidental (per accidens),
e2b. and it remains that essentially (per se) the syllogism proceeds to a UNIVERSAL.

273. VALUE OF THE REDUCTION OF THE IMPERFECT SYLLOGISM: Just as the value of the syllogism is denied by some (n.272), so also the value of the reduction of an imperfect syllogism is denied by some, such as Lachelier;

A. They are moved by this reason that:
a. the reduction is effected by means of conversion; (cf. nn.221-223);
b. but conversion itself, they say, is a syllogism of the third figure (cf. n.267), whereof the major is sub-understood.

B. But it is FALSE, as we have seen above (n.243), to say that conversion is a syllogism.

C. And indeed, since in conversion the signification of P and of S remains unchanged in either proposition, that unexpressed major is tautological, - in spite of whatever Lachelier may say to the contrary.

a. For if the proposition 'man is mortal' is converted into the proposition 'some mortal is man', then, according to Lachelier:
a1. the former is the minor of a syllogism of the third figure,
a2. while the latter is the conclusion of it.

b. But then:
b1. 'Man' (P of the conclusion) must be P of the major;
b2. and 'mortal' (S of the conclusion) must be P of the minor.
b3. Therefore the subject of the minor ('man') must be M.
b4. And thus:
b4a. we get this:

		M		P
MAJOR:		'Man	is	man.
		M		S
MINOR:	But	man	is	mortal.
		S		P
CONCLUSION:	Therefore some	mortal	is	man'.

b4b. which is this:

$$\frac{\begin{array}{c}A = A\\ A = B\end{array}}{B = A}$$

b4c. Which is not surprising:
b4c1. for in conversion the same truth is retained.
b4c2. whereas in reasoning or inference properly so-called there is a passage from one truth to ANOTHER truth. (Cf. nn.241-242).

....

ARTICLE SEVEN.

QUANTIFICATION OF THE PREDICATE.

274. THEORY OF THE QUANTIFICATION OF THE PREDICATE: Hamilton (1788-1856) thought that the theory of the proposition and of the syllogism could be perfected by his doctrine of the quantification of the predicate.

A. He starts from the principle that logic ought to "state explicitly what is thought implicitly", i.e. that logic ought to substitute for the expressions of every-day speech expressions in which everything implicitly contained in thought would be explicitly signified.

B. From this he concludes that in every proposition P ought to be modified by a sign expressing explicitly its quantity.

C. And indeed he regards every proposition as an equation between two concepts of a determinate extension, or, so to speak, between two logical quantities.

a. Thus he regards the proposition 'every man is mortal' as signifying this thought:

The whole expanse of man	=	a determinate part of the expanse of mortal

b. Accordingly he distinguishes:
b1. as many propositions,
b2. as there can be 'a priori' combinations between one logical quantity (universal or particular) and another.

D. Therefore:
a. Instead of the four kinds of propositions (A, E, I, O) distinguished above (n.218, A-B),
b. he distinguishes eight kinds of propositions, thus:-

			NAME	EXAMPLE	SYMBOL
Propositions	Affirmative	1.	toto-total:	'All man is ALL rational'	a-a.
		2.	toto-partial:	'All man is SOME animal'	a-i.
		3.	parti-total:	'Some animal is ALL rational'	i-a.
		4.	parti-partial:	'Some animal is SOME intelligent being'	i-i.
	Negative	5.	toto-total:	'No man is NO angel' or (more correctly) 'Every man is NO angel'	e-e.
		6.	toto-partial:	'No man is SOME animal' (viz. irrational animal)	e-o.
		7.	parti-total:	'Some animal (v.g. man) is NO angel'	o-e.
		8.	parti-partial:	'Some animal (v.g. man) is not SOME intelligent being' (v.g. angel)	o-o.

E. Hamilton says that it is a defect in traditional logic that it has not recognised:

a. these affirmative propositions:
a1. a-a,
a2. i-a;
b. nor these negative propositions:
b1. e-o,
b2. o-o.

F. He enumerates eighteen advantages that his reform would bring to logic, whereof the chief are these:

a. It reduces the conversion of propositions from three species to one, namely, to simple conversion, i.e. to conversion without change of quantity (cf. 222, A).

b. It reduces "all the general rules of categorical syllogisms to a single canon" and results in "the abrogation of all the special laws of the syllogism".
b1. According to this doctrine the syllogism:
b1a. admits thirty-six legitimate moods,
b1b. and rests solely upon the principle of the substitution of similars; for it consists solely:
b1b1. given that y = z (which is the major),
b1b2. in substituting z for its equal (y) in the proposition x = y (which is the minor),
b1b3. thus getting this result x = z (which is the conclusion).
b2. It follows from this that:
b2a. "the figure is a non-essential variation in the syllogistic form,
b2b. "and in consequence it is absurd to reduce the syllogisms of other figures to the first."

275. DOCTRINE OF ARISTOTLE AND OF ST THOMAS: Though it is often thought that this suggestion of the quantification of the predicate has been raised only in recent times, nevertheless it was discussed by Aristotle, Ammonius, Boethius, St Albert the Great, St Thomas, and the mediaeval Nominalists.

A. For ARISTOTLE writes: "But in this that a universal is predicated, that which is to predicate universally is not true. For no affirmation will be true, in which there would be predication universally from a universal predicate, as 'Every man is every animal'." (Periherm. lib.I, c.7).

B. Commenting upon which ST THOMAS says: "Next"(Aristotle) "removes something which could be doubtful. For because he had laid down a certain diversity in the opposition of enunciations from this, that a universal is taken on the part of the subject universally or non-universally, someone might think that a similar diversity would arise from the side of the predicate, to wit, from this, that a universal could be predicated both universally and non-universally; and therefore to exclude this, he says that in this that some universal is predicated, it is not true that a universal is predicated universally. Of which indeed the reason can be twofold.

a. "One indeed, because such a manner of predicating seems repugnant to a predicate according to the proper character which it has in an enunciation.
a1. "For:
a1a. "it has been said above that the predicate is, as it were, the formal part of the enunciation, but the subject is the material part of it;
a1b. "but when some universal is uttered universally, the universal itself is taken according to the relation which it has to the singulars, which it contains beneath itself; just as also when a universal is uttered particularly, it is taken according to the relation which it has to some of those contained beneath it; and thus each of these pertains to the material determination of the universal;
a1c. "and therefore neither the universal sign nor the particular sign is fittingly added to the predicate, but rather to the subject: for more

fittingly is it said: 'no man is an ass', than: 'every man is no ass'; and likewise more fittingly is it said: 'some man is white', than: 'man is some white'.

a2. "But sometimes there is found the particular sign apposed by philosophers to a predicate, to insinuate that the predicate is unto more than the subject; and this chiefly when, having the genus, they are investigating the completive differences of the species, as in II de Anima it is said that soul is a certain act.

b. "But another reason can be taken on the part of the truth of an enunciation:

b1. "and this has place specially in affirmations, which would be false if the predicate were predicated universally. And therefore manifesting what he had laid down, he subjoins that 'There is no affirmation in which,' to wit, truly, 'there would be predication universally from a universal predicate,' that is, in which a universal predicate is used for predicating universally, as if it were said: 'every man is every animal'.

b1a. "For it must needs be, according to what has been said earlier, that this predicate 'animal' according to the singulars which are contained under it, would be predicated of the singulars which are contained under man;

b1b. "and this cannot be true, neither if the predicate be unto more than the subject, nor if the predicate be convertible with it.

b1b1. "For it would be necessary that whatsoever one man be all animals, or all risibles:

b1b2. "which is repugnant to the character of the singular, which is taken under the universal.

b2. "But the negative universal sign or the particular affirmative, although they are more fittingly placed on the side of the subject, nevertheless it is not repugnant to truth if they be placed on the side of the predicate.

b2a. "For it happens that such enunciations in some matter are true: for this is true: 'every man is no stone'; and likewise this is true: 'every man is some animal'.

b2b. "But this: 'every man is every animal', in whatsoever matter it be uttered, is false.

b2c. "But there are certain other such enunciations always false; as this: 'some man is every animal' (which has the same cause of falsity with this: 'every man is every animal');

b2c1. "and if there be others similar, they are always false: for in them all there is the same reason.

b2c2. "And therefore through this, that the Philosopher condemns this: 'every man is every animal' he gives to understand that all similars with it are to be condemned." (In I Periherm. lect.10).

276. VERDICT UPON THIS THEORY: Accordingly the theory of the quantification of the predicate is to be rejected for the following reasons:

A. Quantification of the predicate is "repugnant to the predicate according to the proper character which it has in an enunciation", or, in other words, is incompatible with the proper office of the predicate.

a. For:

a1. though the form of the enunciation or proposition is the very composition or division of the extremes - which composition or division is signified by the copula - (n.203, B);

a2. nevertheless, if the extremes be compared with each other:

a2a. then:

a2a1. "the subject has itself materially" (In I Periherm. lect.8), that is, as receptible of determination;

a2a2. but "the predicate has itself formally" (ibid.), that is, as determination or form.

a2b. Thus in the proposition 'Peter is an artist':

a2b1. 'Peter' is first posited as something which is to receive a determination, (i.e. as a subject),

a2b2. whereupon is applied to that subject the determination 'artist', which application is made by the very composition, i.e. by the very predication, wherefore that determination 'artist' is called the predicated or predicate.

b. But when a universal is quantified (i.e. subjected to determination by 'every' or 'some' or the like):

b1. then it is taken according to its relation to the inferiors contained beneath it,

b2. which "pertains to the material determination of the universal": (as when a form is received in a matter or subject it is materially determined, or limited, by that subject or matter).

b3. And thereby the predicate is made to decline from its "proper character which it has in the enunciation", i.e. from the character of determination or determinant but not of determinable or determined.

c. And this indeed is evident from this, that by quantifying the predicate, it is implicitly and equivalently changed into a subject.

c1. Let us take this example: 'All man is all rational animal':

c1a. This proposition:

c1a1. is not merely an explicitation of this: 'every man is a rational animal',

c1a2. but to it adds also this: 'no non-man is a rational animal': which converted for the elimination of the infinite term 'non-man' becomes this: 'every rational animal is a man', - where 'EVERY rational animal' is a subject, which it could not be by the conversion of the first proposition: 'every man is a rational animal', for the conversion of this would give us: 'SOME rational animal is a man'. (Cf. 223, D).

d. Thus it appears:

d1. That the quantification of the predicate yields a proposition which is equivalently an occultly hypothetic or exponible proposition - an exclusive proposition, (Cf. n.207);

d2. For which reason Levi Ben Gerson (XIV century) writes: "We do not ordinarily add a quantitative sign to the predicate, for were we to do so we would state two 'quaesita'" (i.e. answers to two questions) "at the same time: namely, that the predicate is affirmed of the subject, and that it is denied of everything else."

B. The second reason why the theory of the quantification of the predicate must be rejected appears if we examine those propositions proposed by Hamilton;

a. Let us first take Hamilton's AFFIRMATIVE propositions:

a1. The TOTO-TOTAL (a-a) and PARTI-TOTAL (i-a) propositions are FALSE:

a1a. For:

a1a1. P of an affirmative proposition is always particular (n.71, B.a),

a1a2. (except in this case of convertible propositions; but this is 'per accidens', by reason of the matter: cf. 223, D).

a1b. But if the predicate were taken universally (v.g. 'all rational') as Hamilton would have it in these propositions (a-a and i-a), then,

a1b1. it is taken as communicable to S (man) according to each of the singulars contained under it;

a1b2. so that this would be inferred: 'Peter is all rational (beings)'.

a2. The TOTO-PARTIAL (a-1) and PARTI-PARTIAL (i-i) propositions are AMPHIBOLOGICAL and ILLOGICAL:

a2a. Amphibological indeed, because P does not determine the specific difference; wherefore the proposition may be false according to determination; v.g. 'All man is some animal' is false if 'some animal' is determined to signify 'irrational animal'.

a2b. But illogical, for, as explained above (A), to quantify the predicate is to consider it according to a material consideration, which befits:

a2b1. a subject,

a2b2. but not a predicate.

b. Let us now take Hamilton's NEGATIVE propositions:

b1. The TOTO-TOTAL (e-e) and PARTI-TOTAL (o-e) propositions are USELESS and ILLOGICAL:

b1a. Useless, indeed, because of itself, without a quantitative particle apposed, P in these propositions is universal (n.71, B.b).

b1b. Illogical, for the same reason as that given above in regard to a-i and i-i propositions (B, a2b).

b2. The TOTO-PARTIAL (e-o) and PARTI-PARTIAL (o-o) propositions are AMPHIBOLOGICAL, as was said above regarding a-i and i-i propositions (B,a2a).

277. FOUNDATION OF THE THEORY: This foundation:

A. Lies in the consideration of the sign alone in a reasoning or argumentation, not of the concepts:
a. And therefore the proposition is regarded:
a1. no longer as signifying an identification of S and P,
a2. but only as signifying the equality of the extensions of S and P.
b. Wherefrom it follows that the syllogism:
b1. is not a mode of thinking by which diverse concepts and diverse propositions are linked together,
b2. but as a sort of mathematical operation performed upon signs (after the manner of algebra).

B. Wherefrom appears the nominalistic inspiration of this theory.

……

CHAPTER TWENTY-FOUR.

THE HYPOTHETICAL SYLLOGISM.

278. ORDER OF PROCEDURE: This treatment of the hypothetical syllogism:

A. Will consider:
a. First, the hypothetical syllogism in common.
b. Secondly, the hypothetical syllogism in special; but since, as will appear, the hypothetical syllogism is of three species, this consideration will be tripartite:
b1. In the first place, the disjunctive syllogism will be dealt with;
b2. In the second place, the conjunctive syllogism will be treated;
b3. In the third place, the conditional syllogism will be considered.

B. Hence the following order:-

On the hypothetical syllogism:
- in common......................................Article one.
- in special
  - The disjunctive syllogism.........Article two.
  - The conjunctive syllogism.........Article three.
  - The conditional syllogism.........Article four.

……

ARTICLE ONE.

THE HYPOTHETICAL SYLLOGISM IN COMMON.

279. NOTION OF HYPOTHETICAL SYLLOGISM: It was said above (n.256) that a categorical syllogism can be composed from three hypothetical propositions. It is otherwise with the hypothetical syllogism.

A. As an example of a CATEGORICAL syllogism consisting of hypothetical propositions, take this:

'If Peter is rational, he is capable of laughter.
But if Peter is a man, he is rational.
Therefore if Peter is a man, he is capable of laughter'.

B. As an example, however, of a HYPOTHETICAL syllogism, take this:

'If Peter is rational, he is capable of laughter.
But Peter is rational.
Therefore Peter is capable of laughter'.

C. Therefore a HYPOTHETICAL SYLLOGISM is: a SYLLOGISM WHEREIN THE MAJOR IS A HYPOTHETICAL PROPOSITION WHEREOF ONE PART INDICATES THE CONCLUSION AND THE OTHER PART INDICATES ITS LOGICAL REASON UPON WHICH IT DEPENDS, AND THE MINOR POSITS OR DESTROYS THIS REASON.

280. DIVISION OF THE HYPOTHETIC SYLLOGISM: There are as many species of the hypothetical syllogism as there are species of OVERTLY hypothetic propositions. (Cf. n.207, D).

A. An OCCULTLY hypothetical proposition cannot be the major of a hypothetical syllogism: for since it has only one explicit proposition, there is no room in it to distinguish a minor and a conclusion.

B. Wherefore the hypothetical syllogism is:
a. either CONDITIONAL,
b. or CONJUNCTIVE,
c. or DISJUNCTIVE.

....

ARTICLE TWO.

THE DISJUNCTIVE SYLLOGISM.

281. DEFINITION OF DISJUNCTIVE SYLLOGISM: The nature of the disjunctive syllogism is seen:

A. From some examples:
a. Let us take this example:

'Either Peter is truthful, or Paul is a liar.
But Peter is truthful.
Therefore Paul is not a liar'.

b. As a second example, take this:

'Either Peter is truthful, or Paul is a liar.
But Peter is not truthful.
Therefore Paul is a liar'.

B. Therefore the DISJUNCTIVE SYLLOGISM is a SYLLOGISM WHEREOF THE MAJOR IS A DISJUNCTIVE PROPOSITION, WHILE THE MINOR POSITS OR DESTROYS ONE PART OF THE DISJUNCTIVE.

282. FIGURES OF THE DISJUNCTIVE SYLLOGISM: But since the nature of a disjunctive involves that one part be true and the other false, without the two parts being able to be together true or together false (cf. n.207, G. a2):

A. It follows that:
a. if the minor affirms (posits) one part, the conclusion must deny (remove) the other,
b. and if the minor denies one part, the conclusion must affirm the other.

B. Wherefore there are two FIGURES of the disjunctive syllogism, taken from the minor and conclusion:

a. In the former example given above (n.281, A.a.):

a1. the minor POSITS one part and the conclusion REMOVES the other;

a2. and therefore this figure is called POSITING-REMOVING (PONENDO-TOLLENS).

b. But in the latter example above given (n.281, A.b):

b1. the minor NEGATES one part and the conclusion AFFIRMS the other;

b2. wherefore this figure is called REMOVING-POSITING (TOLLENDO-PONENS).

283. MOODS OF THE DISJUNCTIVE SYLLOGISM: But in each figure there are four moods taken from the major.

A. If both parts of the major are AFFIRMATIVE, then is had the FIRST MOOD:

a. Thus:

FIRST MOOD

IN THE FIRST FIGURE (PONENDO-TOLLENS)	IN THE SECOND FIGURE (TOLLENDO PONENS)
Either A or B. But A........PONENDO Thefore not B.....TOLLENS.	Either A or B. But not A.........TOLLENDO Therefore B.....PONENS.

b. Whereof let us take these examples:

IN THE FIRST FIGURE:	IN THE SECOND FIGURE:
'Either we shall practise austerity, or we shall suffer defeat. But we shall practise austerity. Therefore we shall not suffer defeat.'	'Either we shall practise austerity, or we shall suffer defeat. But we will not practise austerity. Therefore we shall suffer defeat'.

B. If the first part of the major is AFFIRMATIVE and the second part NEGATIVE, then is had the SECOND MOOD:

a. Thus:

SECOND MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
Either A or not B. But A...........PONENDO Therefore B..TOLLENS.	Either A or not B. But not A..............TOLLENDO Therefore not B.....PONENS.

b. Which are illustrated by these examples:-

IN THE FIRST FIGURE:	IN THE SECOND FIGURE:
'Either we shall practise austerity, or we shall NOT avoid defeat. But we shall practise austerity. Therefore we shall avoid defeat'.	'Either we shall practise austerity, or we shall NOT avoid defeat. But we will not practise austerity. Therefore we shall not avoid defeat'.

C. If the first part of the major is NEGATIVE and the second part AFFIRMATIVE, then is had the THIRD MOOD:

a. Thus:

THIRD MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
Either not A or B. But not A........PONENDO Therefore not B...TOLLENS.	Either not A or B. But A........TOLLENDO Therefore B...PONENS.

b. Which are illustrated by these examples:

IN THE FIRST FIGURE:
'Either we shall NOT practise austerity,
or we shall avoid defeat.
But we will not practise austerity.
Therefore we shall not avoid defeat.'

IN THE SECOND FIGURE:
'Either we shall NOT practise
austerity, or we shall
avoid defeat.
But we will practise austerity.
Therefore we shall avoid defeat.'

D. If both parts of the major are NEGATIVE, then is had the FOURTH MOOD:
a. Thus:

FOURTH MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
Either not A or not B. But not A.........PONENDO Therefore B.....TOLLENS.	Either not A or not B. But A........TOLLENDO Therefore not B....PONENS.

b. Which are illustrated from these examples:

IN THE FIRST FIGURE:
'Either we shall NOT practise austerity,
or we shall NOT suffer defeat.
But we shall not practise austerity.
Therefore we shall suffer defeat.'

IN THE SECOND FIGURE:
'Either we shall NOT practise
austerity, or we shall
NOT suffer defeat.
But we will practise austerity.
Therefore we shall not suffer
defeat.'

284. REDUCTION OF THE DISJUNCTIVE SYLLOGISM: The reduction of this syllogism can be made in two ways:

A. Either to a CONDITIONAL SYLLOGISM:
a. by changing the major into a conditional proposition.
b. Thus:
b1. instead of this: 'Either Peter is truthful, or Paul is a liar'.
b2. we get this: 'If Peter is truthful, Paul is not a liar'.
c. Or again:
c1. instead of this: 'Either we shall practise austerity, or we shall suffer defeat'.
c2. we get this: 'If we practise austerity, we shall not suffer defeat'.

B. Or to a categorical syllogism, IF THE TWO MEMBERS HAVE THE SAME SUBJECT.
a. Thus instead of the disjunctive syllogism given above (n. 283, A.a) as an example of the first mood in the first figure, we get this:

'Those who practise austerity will not suffer defeat.
But we shall practise austerity.
Therefore we shall not suffer defeat.'

b. And:
b1. instead of this:

'Either the world does not exist, or it was created by God.
But the world exists.
Therefore it was created by God.'

b2. we get this:

'That which (other than God) exists, was created by God.
But the world (which is other than God) exists.
Therefore the world was created by God.'

C. The LAW is: If the minor does not change the quality of one part, the conclusion must change the quality of the other part; if the minor does change the quality of one part, the conclusion must abstain from changing the quality of the other part.

....

ARTICLE THREE.

THE CONJUNCTIVE SYLLOGISM.

285. DEFINITION OF CONJUNCTIVE SYLLOGISM: The nature of the conjunctive syllogism:

A. Is seen from this example:

'No man can serve God and Mammon.
But John serves God.
Therefore John does not serve Mammon'.

B. Therefore the CONJUNCTIVE SYLLOGISM is a SYLLOGISM WHEREIN THE MAJOR IS A CONJUNCTIVE PROPOSITION, AND WHEREOF THE MINOR POSITS ONE PART AND THE CONCLUSION REMOVES THE OTHER.

286. FIGURE OF THE CONJUNCTIVE SYLLOGISM: However, since both parts of a conjunctive can be together false, there is ONLY ONE FIGURE, to wit, POSITING-REMOVING (PONENDO-TOLLENS), as in the example given above. For from the negation of one part (as this: 'But John does not serve God'), nothing follows, since John may serve neither God nor Mammon.

287. REDUCTION OF THIS SYLLOGISM: The conjunctive syllogism is reduced to a CONDITIONAL syllogism, thus:

'If John serves God, he does not serve Mammon.
But John serves God.
Therefore John does not serve Mammon'.

....

ARTICLE FOUR.

THE CONDITIONAL SYLLOGISM.

288. DEFINITION OF CONDITIONAL SYLLOGISM: The nature of the conditional syllogism, as well as from the preceding example (n.287):

A. Is seen from these examples:
a. Let us take this example:

'If Henry is reading the Bible, he can read.
But Henry is reading the Bible.
Therefore Henry can read'.

b. Let this be a second example:

'If Henry is reading the Bible, he can read.
But Henry cannot read.
Therefore Henry is not reading the Bible'.

B. Therefore the CONDITIONAL SYLLOGISM is a SYLLOGISM WHEREIN THE MAJOR IS CONDITIONAL, WHILE THE MINOR POSITS OR DESTROYS THE REASON.

289. PRINCIPLE AND LAWS OF THIS SYLLOGISM: The conditional syllogism has as:

A. Its SUPREME PRINCIPLE the same principle as every argumentation, to wit: IN EVERY GOOD CONSEQUENCE, THE ANTECEDENT CANNOT BE TRUE WITHOUT THE CONSEQUENT BEING TRUE, BUT NOT CONVERSELY. (Cf. n.248).

B. Wherefrom follow four LAWS:

a. FIRST LAW: THE CONDITION (i.e. the antecedent) BEING POSITED, THE CONDITIONED (i.e. the consequent) IS POSITED, - as in the former example above (n.288, A.a).

b. SECOND LAW: THE CONDITIONED (i.e. the consequent) BEING POSITED, NOT THEREBY IS THE CONDITION (i.e. the antecedent) POSITED. Thus if in the above examples (n.288):

b1. the minor were this: 'But Henry can read',

b2. this would not follow: 'Therefore he is reading the Bible'; for he may be able to read without reading the Bible.

c. THIRD LAW: THE CONDITIONED BEING DENIED, THE CONDITION IS DENIED, - as in the latter example above (n.288, A.b).

d. FOURTH LAW: THE CONDITION BEING DENIED, NOT THEREBY IS THE CONDITIONED DENIED. Thus if in the above examples:

d1. the minor were this: 'But Henry is not reading the Bible',

d2. this would not follow: 'Therefore he cannot read'; for he may be not reading the Bible, and yet be able to read.

C. THESE LAWS ARE EVIDENT, if attention be paid to the supreme law of every argumentation.

a. Sometimes indeed it may seem that the second and fourth laws are false;

b. but this is so only because, frequently in common usage, a second conditional is thought, but left unexpressed: 'and if he is not reading the Bible, he cannot read': then, from this second conditional, - not from the first - are had these syllogisms:

b1. 'But he is not reading the Bible; therefore he cannot read'. But in this case, the minor is not removing (fourth law), but POSITS the condition (first law).

b2. 'But he can read; therefore he is reading the Bible'. Here the minor is not positing, (second law), but DENIES the conditioned (third law).

290. FORMS OF THE CONDITIONAL SYLLOGISM: It follows:

A. That there are TWO legitimate FIGURES of the conditional syllogism: taken from the minor and the conclusion:

a. If the minor posits the condition, - in which case the conclusion posits the conditioned - then is had the FIRST FIGURE, which is called the figure POSITING -POSITING (PONENDO-PONENS).

b. But if the minor destroys the conditioned, - in which case the conclusion destroys the condition - then is had the SECOND FIGURE, which is called the figure REMOVING-REMOVING (TOLLENDO-TOLLENS).

B. But in each of these figures there are FOUR MOODS taken from the major.

a. If both parts of the major are AFFIRMATIVE, then is had the FIRST MOOD:

a1. Thus:

FIRST MOOD

IN THE FIRST FIGURE (PONENDO-PONENS)	IN THE SECOND FIGURE (TOLLENDO-TOLLENS)
If A, then B. But A...........PONENDO Therefore........B....PONENS.	If.....A, then B. But.........not B...TOLLENDO Therefore not A...........TOLLENS.

a2. Which are illustrated by these examples:

IN THE FIRST FIGURE	IN THE SECOND FIGURE
'If Paul is working hard,	'If Paul is working hard,
he is getting a high income.	he is getting a high income.
But Paul is working hard.	But Paul is not getting a high income.
Therefore Paul is getting a high income'.	Therefore Paul is not working hard'.

b. If the condition in the major is AFFIRMATIVE, but the conditioned NEGATIVE, then is had the SECOND MOOD:

b1. Thus:

SECOND MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
If A, then not B.	If.....A, then not B.
But A................PONENDO	But.................B..TOLLENDO
Therefore.........not B....PONENS.	Therefore not A..............TOLLENS.

b2. Which are illustrated by these examples:

IN THE FIRST FIGURE	IN THE SECOND FIGURE
'If Paul is working hard,	'If Paul is working hard,
he is not in debt.	he is not in debt.
But Paul is working hard.	But Paul is in debt.
Therefore Paul is not in debt'.	Therefore Paul is not working hard'.

c. If the condition in the major is NEGATIVE, but the conditioned is AFFIRMATIVE, then is had the THIRD MOOD:

c1. Thus:

THIRD MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
If not A, then B.	If not A, then B.
But not A...........PONENDO	But.........not B..TOLLENDO
Therefore.............B...PONENS.	Therefore.....A..........TOLLENS.

c2. Which are illustrated by these examples:

IN THE FIRST FIGURE	IN THE SECOND FIGURE
'If Paul is not working hard,	'If Paul is not working hard,
he is in debt.	he is in debt.
But Paul is not working hard.	But Paul is not in debt.
Therefore Paul is in debt'.	Therefore Paul is working hard'.

d. If both parts of the major are NEGATIVE, then is had the FOURTH MOOD:

d1. Thus:

FOURTH MOOD

IN THE FIRST FIGURE	IN THE SECOND FIGURE
If not A, then not B.	If not A, then not B.
But not A..............PONENDO	But.................B.TOLLENDO
Therefore............not B...PONENS.	Therefore...A.............TOLLENS.

d2. Which are illustrated by these examples:

IN THE FIRST FIGURE

'If Paul is not working hard,
he is not getting a
high income.
But Paul is not working hard.
Therefore Paul is not getting
a high income.

IN THE SECOND FIGURE

'If Paul is not working hard, he is not
getting a high income.
But Paul is getting a high income.
Therefore Paul is working hard'.

291. RESOLUTION OF CONDITIONAL SYLLOGISMS TO CATEGORICAL SYLLOGISMS: It is sometimes said that the conditional syllogism is reduced to the categorical syllogism.

A. Let us take as an example:
a. this conditional syllogism:

'If Peter is a martyr, he is a saint.
But Peter is a martyr.
Therefore Peter is a saint'.

b. Now:
b1. Let us construct a categoric syllogism whose MAJOR is a universal proposition having:
b1a. as its S the predicate of the condition,
b1b. and as its P the predicate of the conditioned.
b2. Then we get this categoric syllogism:

'Every martyr is a saint.
But Peter is a martyr.
Therefore Peter is a saint'.

c. But this categorical major expresses ANOTHER TRUTH than does the conditional major given above.
c1. For indeed the conditional syllogism is not reducible to a categorical syllogism as the moods of the other figures in the categorical syllogism are reduced to the moods of the first figure, i.e. as the imperfect to the perfect IN THE SAME GENUS (cf. n.269).
c2. Rather it constitutes an illation OF ANOTHER SPECIES,

B. In order to see this:
a. Let us take as example a conditional syllogism wherein the two parts of the major have not the same subject:

'If the world exists, God exists,
But the world exists.
Therefore God exists'.

b. Here the operation performed above is impossible.

C. Therefore conditional syllogisms are resolved into categorical syllogisms:

a. Either in the manner indicated above (A.b), - which can be done when both parts of the major have the same subject.

b. Or by resolving the conditional syllogism into two conditional syllogisms each of which has a major whose two parts have the same subject.
b1. Thus the conditional syllogism given just above (B.a) is resolved thus:

FIRST CONDITIONAL SYLLOGISM:		CATEGORICAL SYLLOGISM:
'If the world exists, it was created by God.	which is in turn resolvable into	'That which exists (without being God) was created by God.
But the world exists.		But the world exists (without being God).
Therefore the world was created by God'.		Therefore the world was created by God'.

SECOND CONDITIONAL SYLLOGISM:		CATEGORICAL SYLLOGISM:
'If God created the world, God exists.	which is in turn resolvable into	'He who created the world exists.
But God created the world.		But God created the world.
Therefore God exists'.		Therefore God exists'.

D. Indeed:

a. By these operations have been destroyed:

a1. both the *unity* of the conditional syllogism,

a2. and that which constitutes its *proper nature*.

b. Wherefrom it appears that the conditional syllogism:

b1. is a syllogism OF *ANOTHER SPECIES* than the categorical syllogism, and is not properly reducible to it.

b2. and contains VIRTUALLY in its unity either one or two categorical syllogisms.

c. And this indeed:

c1. follows from what was said above (n.207, E.a3), to wit, that the conditional proposition expresses a truth of *another species* than does a categorical proposition, namely, truth *from a supposition*.

c2. Wherefrom it follows that a *conditional* syllogism expresses an illation OF ANOTHER SPECIES than does a *categoric* syllogism.

c2a. For the *categoric* syllogism infers a conclusion from the connexion of TERMS, concluding from a universal truth to a universal truth, or, in other words, leading to a conclusion ABSOLUTELY true.

c2b. But the *conditional* syllogism infers its conclusion from the connexion of PROPOSITIONS:

c2b1. for the conclusion of a conditional syllogism is not valid, unless there be a connexion between the condition and the conditioned.

c2b2. And therefore this syllogism reaches a conclusion which is true UNDER A CONDITION, - just as a conditional proposition "affirms something to be true *from a supposition*" (n.207, E.a3).

E. And therefore:

a. Since the connexion of *propositions* presupposes the connexion of *terms*, logically the conditional *syllogism* presupposes the categorical syllogism.

b. For which reason:

b1. *Goblot* (Traite de Logique, nn.98, 112, 118, 120, 153-159) and *Rougier* (Structures des Theories Deductives, pp.6ss), err, when, attempting to reform the ancient logic of Aristotle, they endeavour to construct a universal theory of the conditional syllogism.

b2. As is well shown by *Maritain*: "............that the argumentation founded upon a categorical Major must itself be necessarily *other* than the argumentation founded upon a conditional Major,

b2a. "...........by no means signifies that the conditional syllogism indicates our possession of another logic and other laws of thought than those upon which the categorical syllogism depends. In fact, on the contrary, the conditional syllogism *presupposes* the categorical syllogism just as the conditional proposition presupposes the categorical proposition. The reason that it does not consist in establishing the union or connection of a Pr. to a S by means of a third term is, that this union or connection is already made, already given, in one of the members of the compound proposition which acts as the Major in the conditional reasoning. Therefore there are no grounds for seeing in the conditional syllogism a mode of reasoning that escapes the Logic of 'inherence' or 'predication', that is to say, the Logic which recognizes that we can neither judge nor reason without attributing or refusing a Pr.

to a S. The categorical proposition consists in this attribution itself, and the hypothetical or compound proposition which unites two categorical propositions, supposes this attribution as already made.

b2b. "...........The categorical syllogism orders discourse according to the connection of TERMS. From an antecedent that reveals in a third term the means by which, or the reason for which, two terms should be united to (or separated from) each other, it deduces or infers the proposition that unites these two terms to one another (or separates them). Thus it concludes, at least in so far as logical relations are concerned, from a more universal truth to a less universal truth contained in it.

b2c. "In order that these notions be applicable as such to the conditional syllogism, the latter must be resolved into the categorical syllogism, or the categorical syllogisms, which it contains virtually. But these notions as such are not applicable to the conditional syllogism considered in itself and in its proper nature. So we may say that the conditional syllogism and the categorical syllogism are alike in this: that both have as their object the manifestation of the truth of a conclusion by the resolution of the latter into the first principles of intelligibility, but that they differ in the following characteristics: in conditional reasoning the mind does not apprehend a Minor under the dependence of another proposition as it does in categorical reasoning; it apprehends a Minor under the dependence of a connection of propositions of which this Minor is one of the members. The conditional syllogism orders discourse according to the connection of PROPOSITIONS; from an antecedent which sets forth (in the conditional Major) the connection of two propositions (the sequence), and which presents one of these two propositions as the means or the reason for positing (or destroying) the other, it deduces or infers the position (or destruction) of this other. Hence it is no longer question of manifesting the union (or separation) of two terms to each other by means of a third term or concept, but of manifesting by means of one of the members of the Major the necessity of positing or destroying the other member. Consequently the conditional syllogism does indeed conclude from the whole to the part; but not, as in the categorical syllogism, from a more universal (from the point of view of the logical relations that exist between the connected terms) to a less universal truth, but from a compound proposition to one of the members which it contains. The mind, in the conditional syllogism, does not infer one proposition from another, it infers a proposition from an inference that has already been made and affirmed between two propositions. The need is not to see by a new light and in virtue of an inference which the mind discovers while it affects it, rather it is to affirm or deny something by a renewed application of an already existing light and by the use of a previously made inference.

b2d. "It must be borne in mind, however, that the conditional syllogism may be resolved into the categorical syllogism, and that just as the union of propositions to each other presupposes the union of terms, so does the logical mechanism of the conditional syllogism presuppose the logical mechanism of the categorical syllogism.

b2e. "And that is the fundamental reason why Aristotle neglected to treat of the theory of the conditional syllogism and why those modern logicians, who think to have found in this theory the means of renovating Logic, are completely mistaken. The conditional syllogism is not a primary process of the reason; this manner of inferring a proposition, not from another proposition, but from a previously affirmed sequence between two propositions is, so to speak, a reasoning in the second degree, grafted upon the categorical syllogism which is the sole truly primary form of rational discursus: 'If this figure inscribed in a semi-circle is a triangle, the sum of its angles is equal to two right angles, therefore, etc.' - Granted. - But why is this conditional Major true? Because the sum of the angles of a triangle is equal to two right angles. 'If the human intelligence is independent of matter in its specific operation, it is independent of matter in its be; but, etc.'. Why is this conditional Major true? Because independence of matter in the order of operation necessarily implies independence of matter in the order of be; in other words, because this categorical Major is true: 'Everything independent of matter in its specific operation is independent of matter in its be.' In order to give the reason for a conclusion we must always definitively attain to an essence or a universal nature, that is, to a categorical syllogism (or to an induction in the experimental sciences)." (Maritain: Introduction to Logic, pp.242-245).

F. The FOUNDATION of this error made by Goblot and Rougier is the confusing of the universal and a collection, from which confusion the value of the categorical syllogism perishes (cf. n.272).

a. But, the value of the categorical syllogism being denied, there remains no other way to retain the value of the syllogism save recourse to the conditional syllogism.

b. However, it is impossible to reduce all deductions to conditional syllogisms save by proposing categorical syllogisms disguised as conditional:

b1. Thus wrongly would the following syllogism be regarded as conditional:

'If two triangles have parallel sides, they are similar.
But triangles ABC and DEF have parallel sides.
Therefore triangles ABC and DEF are similar'.

b2. For this is a categorical syllogism:

b2a. For it is equivalent to this syllogism:

'Two triangles having parallel sides are similar.
But triangles ABC and DEF have parallel sides.
Therefore triangles ABC and DEF are similar'.

b2b. Such a syllogism is categoric, for the illation is based upon identification:

b2b1. of P (similar),

b2b2. and of S (triangles ABC and DEF),

b2b3. with M (two triangles having parallel sides).

b3. But the following syllogism would be truly conditional:

'If triangles ABC and DEF have parallel sides, they are similar.
But triangles ABC and DEF have parallel sides.
Therefore triangles ABC and DEF are similar'.

b4. For not identical are these propositions:

b4a. 'If a triangle has sides parallel to another.........'

b4b. 'If triangle ABC has sides parallel to another.........'

……

CHAPTER TWENTY-FIVE.

OTHER DIVISIONS OF THE SYLLOGISM.

292. ORDER OF PROCEDURE: So far we have dealt with the essential division of the syllogism properly so-called.

A. Here, accordingly, we shall deal with:

a. First, accidental divisions of the syllogism both categoric and hypothetical.

b. Secondly, the syllogism improperly so-called.

B. Hence the following order:-

Other divisions of the syllogism:
  Accidental divisions......................Article one.
  The syllogism improperly so-called........Article two.

……

ARTICLE ONE.

ACCIDENTAL DIVISIONS OF THE SYLLOGISM.

293. FOUNDATION OF ACCIDENTAL DIVISIONS: The accidental divisions of the syllogism - which are common to the categorical and hypothetical syllogism - have as their foundation:

A. Either the proximate matter, i.e. the propositions: (which divisions will be treated in n.294).

B. Or the remote matter, i.e. the terms: (which division will be exposed in n.295).

C. Or the argumentation itself: (which divisions will be expounded in n.296).

294. DIVISIONS ON THE SCORE OF PROXIMATE MATTER: These divisions are on three heads:

A. On the score of the quality of the conclusion, a syllogism is:
a. either AFFIRMATIVE, - if the conclusion affirms;
b. or NEGATIVE, - if the conclusion denies.

B. On the score of predication, a syllogism is:
a. either ABSOLUTE, - if the propositions are simply attributive (or of in-be);
b. or MODAL, - if the propositions are modal. (Cf. n.208, B).

C. On the score of integrity, a syllogism is:
a. either COMPLETE, - if all the premisses are expressed;
b. or INCOMPLETE, - if one premiss remains unexpressed; and in this case the syllogism is called an ENTHYMEME.

295. DIVISION OF THE SCORE OF REMOTE MATTER: This division is on the score of the terms:

A. As an example:
a. let us take this syllogism:

'An animal is mortal.
But man is an animal.
Therefore man is mortal'.

b. Here:
b1. all the terms are in the direct (nominative) case. (Cf. n.66, B).
b2. Wherefore this syllogism is called a DIRECT syllogism.

B. But sometimes one or another term of a syllogism is in an oblique case, i.e. it is not S or P of a proposition but has a relation with the S or P.
a. Let us take this example:

'Christ is God.
But Mary is the MOTHER of Christ.
Therefore Mary is the MOTHER of God.'

b. Here:
b1. M (Christ):
b1a. in the major is direct,
b1b. but in the minor is oblique.
b1c. and determines P of the major (God), which in the major is direct, to be oblique in the conclusion.
b2. Therefore this syllogism is called an OBLIQUE syllogism.

296. DIVISION ON THE SCORE OF THE ARGUMENTATION ITSELF: On the score of the argumentation itself, a syllogism is:

A. Either SIMPLE, - if it consists of three propositions only, as in all the examples so far given.

B. or COMPOUND, - if it consists of more than three propositions.

a. Let us take these examples:
a1. First example:

'Every martyr is a saint, because he has heroic charity.
But Peter is a martyr.
Therefore he is a saint'.

a2. Second example:

'Every spiritual substance is a simple substance.
But human soul is a spiritual substance.
Therefore human soul is a simple substance.
But every simple substance is incorruptible.
Therefore human soul is incorruptible'.

a3. Third example:

'Peter is a man.
But every man is an animal.
But every animal has instincts.
But everything endowed with instincts has spontaneous reactions.
Therefore Peter has spontaneous reactions'.

a4. Fourth example: Let this example be the famous argument of Tertullian against the Emperor Trajan, who, when Pliny sought from him a ruling as to whether the Christians ought to be searched out and tried at his tribunal, replied: 'Do not seek them out; but if they are brought before your tribunal, condemn them': Tertullian argued thus:

'The Christians are either harmful, or harmless.
But if they are harmful, your decree is unjust; (to the state);
but if they are harmless, your decree is unjust. (to the Christians).
Therefore in either case, your decree is unjust'.

b. All these syllogisms are COMPOUND: however they are of diverse species:

b1. In the first example, the composition consists in this, that the major contains its proof. A SYLLOGISM IN WHICH ONE PREMISS, OR EACH PREMISSES, CONTAINS ITS PROOF, is called an EPICHEIREME.

b2. In the second example the CONCLUSION OF ONE SYLLOGISM IS THE MAJOR OF THE NEXT: wherefore this is called a POLYSYLLOGISM.

b3. In the third example THERE ARE MANY MINORS; wherefore it is called a SORITES.

b3a. But note:
b3a1. that in the example given above:
b3a1a. S of the conclusion is S of the first proposition,
b3a1b. P of the conclusion is P of the last antecedent proposition;
b3a1c. M is successively:
b3a1c1. P of the first proposition and S of the second;
b3a1c2. P of the second proposition and S of the third;
b3a1c3. P of the third proposition and S of the fourth; and so on.
b3a2. Such a sorites is called the ARISTOTELIC SORITES.

b3b. But GOECKEL (Goclenius: 1547-1628) constructed another sorites, in which the terms in all the propositions are disposed according to the first figure: thus:

'Everything endowed with instincts has spontaneous reactions.
But every animal has instincts.
But every man is an animal.
But Peter is a man.
Therefore Peter has spontaneous reactions'.

b3c. That the difference between these two sorites may appear the more clearly, they may be thus shown schematically:-

SORITES

OF ARISTOTLE	OF GOECKEL
Peter is a man.	Everything endowed with instincts HAS SPONTANEOUS REACTIONS.
Man is an animal.	Every animal has instincts.
An animal has instincts.	Every man is an animal.
Everything endowed with instincts HAS SPONTANEOUS REACTIONS.	Peter is a man.
Therefore Peter HAS SPONTANEOUS REACTIONS.	Therefore Peter HAS SPONTANEOUS REACTIONS.

b4. In the fourth example THE MAJOR IS A DISJUNCTIVE PROPOSITION TO WHICH THE TWO PARTS ARE SUCCESSIVELY SUBMITTED AS MINORS, FROM WHICH THE SAME CONCLUSION FOLLOWS: which syllogism is called a DILEMMA (or, if there be three parts of the major and accordingly three minors, a TRILEMMA, and so on).

b4a. In order that a dilemma be legitimate, the disjunctive must be complete, and the consequent must follow legitimately and exclusively.

b4a1. The following is not a legitimate dilemma, because the disjunctive is not complete:

'Every philosopher is either an innatist or a sensualist.
But if an innatist, he flies in the face of evidence;
but if a sensualist, he flies in the face of evidence.
Therefore every philosopher flies in the face of evidence'.

b4a2. But the following offends by illegitimacy of consequent:

'Either the books of the library of Alexandria contain the same as the Koran, or they do not contain the same.
But if the same, they are USELESS............(ILLEGITIMATE CONSEQUENT)
but if not the same, they are BAD............(ILLEGITIMATE CONSEQUENT)
Therefore they ought to be burnt'.

b4a3. But in the following example:
b4a3a. the CONCLUSION IS NOT EXCLUSIVE, wherefore the dilemma can be retorted:

'You will rule the state either well or ill.
But if well, you will incur the disfavour of the people;
but if ill, you will incur the disfavour of God.
Therefore in either case you will incur disfavour'.

b4a3b. Which is thus retorted:

'I shall rule the state either well or ill.
But if well, I shall win favour with God;
but if ill, I shall win favour with the people.
Therefore in either case I shall win favour'.

b4b. Care is to be taken:

b4b1. not to confuse a dilemma with a disjunctive syllogism, even if the latter have the appearance of a dilemma.

b4b2. For from a disjunctive syllogism not the same conclusion follows from each part of the disjunctive proposition. (Cf. n.281).

297. SCHEMATIC SUMMARY: Accordingly the syllogism is ACCIDENTALLY divided as thus shown schematically:-

- The syllogism is ACCIDENTALLY divided:
  - by reason of its matter
    - and indeed proximate:
      - On the score of the quality of the conclusion, into
        - AFFIRMATIVE.
        - and NEGATIVE.
      - On the score of predication, into
        - ABSOLUTE.
        - and MODAL.
      - On the score of integrity, into
        - COMPLETE.
        - and INCOMPLETE (ENTHYMEME).
    - and indeed remote, into
      - DIRECT
      - and OBLIQUE.
  - by reason of the illation, into
    - SIMPLE.
    - and COMPOUND: which is divided into
      - EPICHEIREME.
      - POLYSYLLOGISM.
      - DILEMMA.
      - and SORITES.

……

ARTICLE TWO.

THE SYLLOGISM IMPROPERLY SO-CALLED.

298. NOTION AND DIVISION OF SYLLOGISM IMPROPERLY SO-CALLED: In every syllogism properly so-called from one truth is inferred ANOTHER TRUTH. (nn.241-242, 255).

A. Therefore whenever by a syllogism there is not inferred a NEW TRUTH, this is a syllogism improperly so-called.

B. The syllogism improperly so-called is twofold, to wit:
a. the expository syllogism,
b. and the explicative syllogism.

299. THE EXPOSITORY SYLLOGISM: Let us take:

A. This example:

'Judas betrayed Christ.
But Judas was an apostle.
Therefore an apostle betrayed Christ'.

B. This is an EXPOSITORY syllogism or syllogism of exposition.
a. M IS SINGULAR (Not particular),
b. and therefore there is no passage from one truth to another.

C. Here there is not truly an illation:
a. because the principle 'SAID OF EVERY, SAID OF NO' (dictum de omni, dictum de nullo), which every true illation supposes, (since every genuine illation has a universal objective concept as its M), has here no place.
b. The expository syllogism is immediately regulated by the principle of triple identity or of the separating third (cf. n.257, A.b).

D. "The expository syllogism:
a. "is not truly a syllogism,
b. "but is rather a certain sensible pointing-out or an analysis made to the senses for this purpose, that the consequence, which is true according to intellectual knowledge, be declared in a sensible" (medium). (De natura syllogismorum: a work long apocryphally attributed to St Thomas).
c. "In this case, the syllogistic form plays the same role as does the material object or the diagram drawn upon the blackboard as a help in certain demonstrations." (Richard: Philosophie du Raisonnement, p.363).

E. Although it can be constructed according to all the figures, yet its most perfect figure is the third (n.266, C):
a. in which M is twice subjected,
b. which is proper to the individual, (to which it is not proper to be attributable as a predicate).

F. As regards its moods: (note that in the expository syllogism A signifies a singular affirmative, and E a singular negative):
a. In the second figure (cf. n.266, C):
a1. besides the negative moods,
a2. it has also four legitimate affirmative moods, (whereof the premisses are AA, II, AI and IA).
b. But in the third figure only two moods rightly conclude, to wit, whose premisses are AA and EA.

300. THE EXPLICATIVE SYLLOGISM: From the expository syllogism must be distinguished:

A. The explicative syllogism:
a. Whereof this is an example:

'Man is mortal.
But a rational animal is a man.
Therefore a rational animal is mortal'.

b. Here:
b1. M is universal, and therefore there is a true illation.
b2. Nevertheless, it is NOT a syllogism PROPERLY SO-CALLED, because it does NOT infer in the conclusion another truth, i.e. a judgment other than in the premisses.

B. For here:
a. The conclusion:

a1. expresses the same truth,
a2. but explicates it BY OTHER CONCEPTS.
b. For:
b1. these two propositions:
b1a. 'man is mortal',
b1b. 'rational animal is mortal',
b2. express the same truth,
b3. but the latter expresses it by more distinct concepts than the former.
c. Wherefore to this is rightly given the name of EXPLICATIVE syllogism.

C. In the explicative syllogism:
a. the conclusion:
a1. is IDENTICAL AS REGARDS ITSELF (quoad se) with the major,
a2. but NOT AS REGARDS US (non quoad nos);
b. And therefore:
b1. there is a formal illation,
b2. but not an objective illation. (Cf. Schultes: Introd. ad Historiam Dogmatum).

D. OBSERVE that the major and the conclusion of an explicative syllogism are in THE SAME MODE OF SAYING 'PER SE' (cf. nn.230-232); otherwise there would be had, not an explicative syllogism, but a syllogism PROPERLY SO-CALLED.
a. In the example given above (A.a), both these propositions are IN THE SECOND MODE of saying 'per se'.
b. But the case is otherwise:
b1. with this syllogism:

> 'A rational animal is capable of science.
> But man is a rational animal.
> Therefore man is capable of science'.

b2. Here:
b2a. The major is in the FOURTH mode of saying 'per se': otherwise the syllogism would be employed to no purpose.
b2b. But the conclusion is in the SECOND manner of saying 'per se'.
c. Wherefore this is a syllogism properly so-called.

……

SECTION THREE.

……

INDUCTION.

……

CHAPTER TWENTY-SIX.

……

INDUCTION.

……

301. ORDER OF PROCEDURE: This chapter on induction - constituting the section on induction - :

A. Will consider:
a. First, the nature of induction.
b. Secondly, the division of induction.
c. Thirdly, imperfect induction.

B. Hence the following order:-

On induction
- Its nature....................................Article one.
- Its division..................................Article two.
- As imperfect..................................Article three.

……

ARTICLE ONE.

NATURE OF INDUCTION.

302. IMPOSSIBILITY OF REACHING SYLLOGISTICALLY A UNIVERSAL CONCLUSION FROM PARTICULAR OR SINGULAR PREMISSES: Let us take:

A. this syllogism:

'Man is mortal.
But Peter is a man.
Therefore Peter is mortal'.

a. By interchanging the major and the conclusion, this syllogism does not become this:

'Peter is mortal.
But Peter is a man.
Therefore man is mortal'.

b. because in the conclusion S (man) has a greater extension than in the minor. (Cf. n.71, B.a).

B. Rather:
a. the conclusion then ought to be: 'SOME man is mortal'.
b. Then again, this is a syllogism improperly so-called, to wit, an EXPOSITORY syllogism. (Cf. n.299).

C. Wherefrom it appears that, by means of a syllogism, it is impossible that a universal conclusion follow from particular or singular premisses, according to the rule: 'the conclusion always follows the worse part' (n.259, B.c). For the syllogism, as has been repeatedly said, does not deduce a universal conclusion save from a universal.

303. THAT ARGUMENTATION IS MATERIALLY GOOD: Nevertheless:

A. To consider again that argumentation given above (n.302, A.a), to wit:

'Peter is mortal.
But Peter is a man.
Therefore man is mortal'.

B. This argumentation is materially good because Peter is mortal ON ACCOUNT OF HIS NATURE composed, as it is, from soul and body:
a. for man is composed from soul and body;
b. and therefore the reason on account of which Peter is mortal is found in every man;
c. and thus by reason of the matter of this argumentation it is rightly concluded: 'Man is mortal'.

304. ANOTHER MODE OF REASONING: But one who does not know the reason on account of which Peter is mortal, but only observes experimentally that

many men, to wit, not only Peter, but also James, John, Cecilia, Agnes, etc, die, understands, on account of the CONSTANCY of the fact, that there is found in these individuals some common (universal) factor which is the reason of death. But this one factor is human nature, by virtue of which they are men. And therefore he he reasons thus:

'Peter, James, John, Cecilia, and Agnes are mortal.
But the universal which is in Peter, James, John, Cecilia and Agnes, is man.
Therefore man is mortal'. Let us designate this reasoning as (1).

A. This reasoning differs ESSENTIALLY from the syllogism LATENT in the example given above (n.303, A), in virtue of which that example was materially good: which latent syllogism is this:

'Everything composed from soul and body is mortal.
But man is composed from soul and body.
Therefore man is mortal'. Let us designate this syllogism as (2).

a. Now:
a1. In the syllogism (2), the major expresses this, that some concept (P) agrees with another concept (S of the major);
a2. But in that reasoning (1), the major says that the same concept (P) agrees:
a2a. not with some concept,
a2b. but distributively with many individuals (S of the major).

b. But:
b1. In the minor of the syllogism (2) P of the minor is affirmed of another concept (S of the minor);
b2. whereas in the minor of that reasoning (1):
b2a. there is affirmed the agreement of some concept (P of the minor) with the same concept which IS IN Peter, James, John etc, to wit, HUMAN NATURE,
b2b. and that concept (P of the minor: 'man') is predicated of human nature which is in Peter, James, John etc.

B. Wherefrom it appears that:
a. In the syllogism (2), there is an M ('composed from soul and body'),
b. Whereas in that other reasoning (1) there is not an M (middle term).
b1. For in the major is found an enumeration of parts (subjective parts: cf. n.190,D).
b2. for which there is substituted in the minor a universal standing for or representing these parts.
c. In other words:
c1. Whereas in the syllogism (2), there is a middle TERM,
c2. In that other reasoning (1) there is no middle TERM:
c2a. but that which takes the place of the middle term, which is the MEAN of argumentation, is not a term or a concept, but an ENUMERATION OF INDIVIDUALS OR OF PARTS:
c2a1. which individuals or subjective parts are taken in the major distributively (i.e. one by one),
c2a2. while in the minor they are taken in the unity of the universal concept which represents or stands for them.

305. DEFINITION OF INDUCTION: This manner of reasoning:

A. Which therefore is FORMALLY diverse from the syllogism:
a. is called INDUCTION,
b. which essentially consists in a PASSAGE OF THE MIND FROM PARTS TO A UNIVERSAL WHOLE (cf. n.186, F).

B. Therefore INDUCTION is defined: PROGRESSION OF THE MIND FROM SINGULARS SUFFICIENTLY ENUMERATED TO A UNIVERSAL.

a. An enumeration is said to be sufficient:
a1. when it is such as to permit passage from the parts to the whole.

a2. It is diverse according to diverse matters (i.e. it varies according to the case).

b. Therefore:

b1. Whereas:

b1a. The syllogism REMAINS in the intelligible order, or on the plane of concepts or of universals, - being a passage from universal to universal, -

b1b. Induction, on the other hand, is an INTRODUCTION from the sensible order to the intelligible order, or a passage from the plane of singular sensibly observed facts to the plane of concepts or of universals.

b2. Which is well explained by Maritain:

b2a. "This difference has its roots in the very nature of our mind, which cannot attain to truth except it base itself upon two kinds of essentially different principles:

b2a1. "upon sense data and singular facts known through sense experience - material principle of all our knowledge (from which all our knowledge is derived);

b2a2. "upon self-evident, self-known intelligible truths - formal principles of all our knowledge ('first principles' by which all our knowledge is demonstrated)."

b2b. now:

b2b1. "To show how a conclusion derives from previously known universal truths, or in the terminology of the ancients, to 'resolve' a conclusion into the intelligible truths upon which it depends (and finally into the self-evident truths) is to proceed by the deductive or syllogistic method (resolutio formalis).

b2b2. "To show how a conclusion is disengaged, so to speak, from sense experience, in other words, to resolve a conclusion into the facts from which our mind extracts it as from a matter (resolutio materialis) is to proceed by the inductive method."

b2c. Accordingly:

b2c1. "In the syllogism we remain upon the intelligible plane, we move from one point of this plane to another, as a submarine that navigates horizontally upon the surface of the ocean.

b2c2. "By induction we attain to the intelligible plane, we move from the sensible plane to the intelligible plane, as a submarine that navigates vertically upwards from below.

b2d. "It is in this sense that Aristotle and St Thomas teach that:

b2d1. "we have but two means of acquiring knowledge: viz.:

b2d1a. "the syllogism, which proceeds from universal truths,

b2d1b. "and induction which proceeds from singular data;

b2d2. "for all our knowledge:

b2d2a. "depends formally upon first self-evident truths,

b2d2b. "and derives its origin materially from the singular and concrete reality perceived by the senses." (Maritain: Introduction to Logic, pp.258-259).

C. NOTE that the above definition of induction is taken from its principal or absolutely first function, which is to ASCEND, i.e. to infer a universal truth from singulars, or, in other words, to proceed from the parts to the whole.

a. But it is to be observed that induction - and in this reversibility also it differs from the syllogism - may DESCEND from the intelligible to the sensible, from the whole to the parts, from the universal to the singular, - just as the submarine which RISES UPWARDS from below to the surface may also GO DOWNWARDS from the surface to below.

a1. This irreversibility of the syllogism is due to its impotence to infer a more universal conclusion from a less universal premiss (cf. n.302).

a2. But induction is reversible:

a2a. because its minor affirms the identity of a universal whole considered in itself (v.g. 'man') with the same universal considered in relation to its parts (v.g. 'Peter', 'James', 'John' etc); wherefore this minor is a convertible proposition (cf. n.230,C).

a2b. Thus:

a2b1. this induction which ASCENDS from PARTS TO WHOLE:

'Copper
and iron
and gold .... is a conductor of electricity
and silver
and zinc

But the universal which
relatively to 'conductor
of electricity' has as
its subjective parts: .... is metal .... ASCENDING INDUCTION.

copper
and iron
and gold
and silver
and zinc

Therefore metal is a conductor of electricity' ....

a2b2. is thus reversed so as to DESCEND from WHOLE TO PART:

'Metal is a conductor of electricity ....

But
copper
and iron
and gold — are subjective parts of the universal: metal. — DESCENDING INDUCTION.
and silver
and zinc

Therefore iron (or copper etc) is a conductor of electricity' ....

b. This descending induction is not to be confused with a syllogism:

b1. such as this syllogism:

'Every metal is a conductor of electricity.
But iron is a metal.
Therefore iron is a conductor of electricity'.

b2. For:

b2a. Here, (in the syllogism) 'metal' is a middle term which identifies the other terms ('iron' and 'conductor of electricity') with each other.

b2b. But in the (descending) induction 'metal' is a superior universal dividing itself into its subjective parts.

c. From what has been said it is evident:

c1. That a singular conclusion (v.g. 'Peter is mortal') may be inferred either syllogistically or inductively by ~~descending induction~~:

c1a. Syllogistically indeed:

c1a1. thus:

'Man is mortal.
But Peter is a man.
Therefore Peter is mortal'.

c1a2. Here:

c1a2a. The inference or illation is based upon the connexion of three concepts ('mortal', 'Peter', 'man');

c1a2b. and the conclusion is drawn:

c1a2b1. not because 'Peter' is a subjective part of 'man', (cf. n. 272, B).

c1a2b2. but because 'Peter' and 'mortal' are identified by means of 'man'.

c1b. But also inductively by inductive descent:

c1b1. thus:

'Man is mortal.
But to say man is to say Peter and James and John etc.
Therefore Peter is mortal'.

c1b2. Here:

c1b2a. The inference or illation is based upon the identity of the universal whole 'man' with this same whole as it IS IN its subjective parts ('Peter', 'James', 'John' etc);

c1b2b. and the conclusion is drawn because 'Peter' is a subjective part of 'man'.

c2. And that a universal conclusion (v.g. 'Iron conducts electricity') may be inferred either syllogistically or inductively by ascending induction or inductively by a descending induction:

c2a. Syllogistically indeed thus:

'Every metal conducts electricity.
But iron is a metal.
Therefore iron conducts electricity'.

c2b. But inductively by inductive descent, thus:

'Metal conducts electricity.
But to say metal is to say copper and iron and silver and gold etc.
Therefore iron conducts electricity'.

c2c. But also inductively by inductive ascent, thus:

'This piece of iron, and this one, and this one, etc, conducts electricity.
But the universal which is in this piece and this piece and this piece etc. is iron.
Therefore iron conducts electricity'.

306. SCHEMATIC RECAPITULATION: The difference between the syllogism and induction may be therefore thus schematically illustrated as by Maritain (Introduction to Logic, p. 263):

INDUCTION	SYLLOGISM
a1 a2 a3 a4 a5 is B.	C is B.
But the universal which relatively to B has as its subjective parts a1, a2, a3, a4, a5 is A.	But A is C.
Therefore A is B.	Therefore A is B.

307. IRREDUCIBILITY OF INDUCTION TO THE SYLLOGISM: From what has been said, it is evident:

A. That those modern writers ERR who:

a. along with Lachelier (Etude sur le Syllogisme, pp. 37-38), reduce induction to a syllogism of the third figure;

b. or with Wolf reduce it to an enthymeme (cf. n. 294, C) whose major: 'that which is attributable to all the individuals is attributable to the universal which contains them', would be thought, but left unexpressed.

B. But neither of these assertions can be admitted:

a. For in either case, no induction would be legitimate unless it were complete: for an incomplete induction could not be reduced to a legitimate syllogism or enthymeme, since the syllogism or enthymeme would have S more universal in the conclusion than in the premisses.

b. The syllogism or the enthymeme would be illegitimate whenever the enumeration of parts is incomplete; for otherwise S would be taken more universally in the conclusion than in the premisses.

C. Accordingly, if induction were a kind of syllogism:

a. then (except in those cases where the enumeration of parts is complete), it would be only an invalid reasoning and illegitimate;

b. wherefore it would rightly be excluded from logic - as some recent logisticians - nominalists - have excluded it.

D. The FOUNDATION of this error of these modern writers is their NOMINALISM, according to which there is no universal, but only a collection of individuals. And therefore:

a. just as according to the same writers, and for the same reason, every legitimate syllogism is a hypothetical syllogism (cf. n.291, F),

b. so induction is reduced to a hypothetico-deductive reasoning. (Cf. Lalande: Les theories de l'induction et l'experimentation, p.234).

E. Therefore it is a fundamental error - of which many modern writers are guilty - to explain induction from the point of view of a collective whole or of a simple collection; that is, to regard induction as consisting in a process of passing a predicate verified of some members of a certain collection either to an entire collection of individuals taken as a collection, or to all the individuals of a collection taken as individuals.

a. For in the former case, induction would be an illegitimate process such as this:

	'Player a player b player c player d	has an immortal soul.
But	player a player b player c player d	are the tennis team.

Therefore the tennis team has an immortal soul'.

b. In the latter case, induction would be sterile, not yielding a new truth, but merely tautological, and would not express a genuine reasoning, but would merely collect many singular truths distinctly expressed into one collection, and at most would serve as a mere sensible representation (as might be effected by a diagram or by counting on one's fingers):

b1. Such would be this example:

	'Peter John James the Major James the Minor Andrew Philip Thomas Bartholomew Matthew Simon Judas Matthias	was in the supper-room
But	Peter John James the Major James the Minor Andrew Philip Thomas Bartholomew Matthew Simon Judas Matthias	are the apostles.

Therefore ALL the apostles WERE in the supper-room'.

b2. Here:
b2a. There is:
b2a1. NO ASCENT to a universal,
b2a2. but only a passage from many singular truths distinctly expressed in the 'major' to the SAME SINGULAR TRUTHS collectively expressed in the 'conclusion'.
b2b. Yet:
b2b1. this is what many modern writers understand by 'formal induction',
b2b2. and they think that this is the only kind of induction known to the ancients, - although the ancients never thought it worthy of consideration in their treatment of induction.

c. But in reality:
c1. Induction consists in attributing to an intelligible UNIVERSAL a predicate verified of some of the individuals or of some of the subjective parts in which this universal is realized (n.305, A.b);
c2. Which operation is legitimate when the enumeration of the individuals or subjective parts is sufficient.
c3. Wherefore:
c3a. In its correct formulation:
c3a1. ascending induction has its conclusion formulated thus: 'EVERY (metal) IS' (or simply 'METAL IS'); but not thus: 'ALL...........ARE',
c3a2. and descending induction has its major formulated thus: 'EVERY (metal) IS' (or simply 'METAL IS'); but not thus: 'ALL............ARE'.
c3b. For it is essential to induction that it transfer a predicate:
c3b1. not from 'some' to 'ALL',
c3b2. but from 'some' to 'EVERY'.

308. SUPREME PRINCIPLE OF INDUCTION: It is evident from this, that the nature of induction is diverse from the nature of the syllogism, as explained, that the supreme principle of induction is other than the supreme principle of the syllogism.

A. And indeed the SUPREME PRINCIPLE of induction is: WHAT IS TRUE OF MANY SUFFICIENTLY ENUMERATED PARTS OF A DETERMINATE UNIVERSAL SUBJECT IS TRUE OF THIS UNIVERSAL SUBJECT.

a. This principle, like the supreme principle of the syllogism, is self-evident.

b. NOTE therefore that induction legitimately concludes ONLY WHEN the enumeration of parts is SUFFICIENT.
b1. But the enumeration of parts is SUFFICIENT when we have reviewed a sufficient number to know (with certitude or at least probably):
b1a. that they are, in relation to this predicate (v.g. 'conductor of electricity'), really the parts of this universal (v.g. 'metal'), and not of another more restricted universal (v.g. 'metal thus and thus physically or chemically conditioned')
b1b. or, in other words, that the universal which represents them in relation to this predicate is really the universal ('metal') which we are considering.
b2. But if a French boy argued:
b2a. thus:

'Pierre
Louis
Jacques
Francoise
Bernadette] speaks French.........................PARTS INSUFFICIENTLY ENUMERATED, in relation to the universal 'man'.

But the universal which relatively to the predicate 'speaking French' has as its subjective parts:
[Pierre
Louis
Jacques
Francoise
Bernadette] is man.... TOO BROAD A UNIVERSAL in relation to the predicate 'speaking French'.

Therefore (every) man speaks French'............... CONCLUSION ILLEGITIMATELY DRAWN.

b2b. he makes an illegitimate inference; and indeed:

b2b1. a further enumeration of parts, such as to include 'William' and 'Gustav' (viz. individuals not educated in French), would show that not every man speaks French.

b2b2. and the universal which really represents those parts is a universal less broad than 'man', namely 'man educated in French'.

B. Accordingly:

a. When the enumeration of parts is sufficient, the mind CAN, and indeed, MUST, conclude from the parts to the whole (i.e. to the universal).

b. But:

b1. since very frequently the enumeration of parts is sufficient to know only probably that these parts are really, in relation to this predicate (v.g. 'conductor of electricity') the parts of this universal (v.g. 'metal'), and not of some more restricted universal (v.g. 'metal thus and thus conditioned physically or chemically conditioned'),

b2. therefore induction very frequently yields only a probable conclusion.

....

ARTICLE TWO.

DIVISION OF INDUCTION.

309. DIVISION INTO COMPLETE AND INCOMPLETE INDUCTION: Induction is divided:

A. into:

a. COMPLETE induction, wherein all the subjective parts of the whole are enumerated;

b. and INCOMPLETE induction, wherein not all the subjective parts of the whole are enumerated.

B. But this division is to be rightly understood.

310. COMPLETE INDUCTION: Not the same is meant by the name 'complete induction' by the SCHOLASTICS and by MODERN logicians.

A. By the SCHOLASTICS the name 'complete induction' is given, not only to induction wherein all the parts are formally enumerated, but also to induction wherein all the parts are only VIRTUALLY ENUMERATED; or, in other words, not only to induction which is formally complete, but also to induction which is only virtually complete.

a. Of these two:

a1. Induction formally complete corresponds to that which MODERN writers call complete induction;

a2. Induction virtually complete corresponds to that which MODERN writers call incomplete induction wherein nevertheless the parts are sufficiently enumerated to permit a legitimate conclusion.

b. But, because, they are ignorant of this distinction (between enumeration formally complete and enumeration virtually complete),

b1. many MODERN writers mistakenly think that SCIENTIFIC (i.e. incomplete yet sufficient) induction:

b1a. was discovered by FRANCIS BACON (1561-1628),

b1b. and was unknown to ARISTOTLE and the SCHOLASTICS.

b2. For which reason they call:

b2a. complete induction (i.e. induction formally complete) by the name of ARISTOTELIAN induction,

b2b. and incomplete induction (i.e. induction virtually complete, or incomplete yet sufficient, or scientific) by the name of BACONIAN induction.

c. But the truth is:

c1. that ARISTOTLE deals with induction:

c1a. In the 'Analytica Priora' (I, 2, c.23):

c1a1. where the illustration which he uses shows that he has in mind an incomplete yet sufficient induction;

c1a2. and where the sentence: "We must apprehend C" (the mean of induction) "as made up of all the particulars, for induction proceeds through an enumeration of cases" (Analyt. Priora, b8 b, 27) signifies that the enumeration can be taken as if it were complete, that is, it is virtually complete.

c1b. In the 'Topica' (I, 12) where also Aristotle clearly has in mind incomplete induction.

c1c. In the 'Analytica Posteriora' (I, c.18).

c2. ST ALBERT THE GREAT deals with induction:

c2a. in his commentary 'in Analytica Priora' (I, II, tract.VII, c.4);

c2b. and in his commentary (in Topica' (I, II, tract. III, c.4).

c3. ST THOMAS deals with induction in his commentary 'in Analytica Posteriora' (II, lect. 4).

c4. JOHN OF ST THOMAS deals with induction in his 'Cursus Philosophicus' (I, p.16; pp.60ss; p.98ss: ed.Resier).

d. Yet it is to be admitted that this distinction has no place in a nominalistic theory of induction:

d1. For there cannot be an enumeration VIRTUALLY complete, save where the UNIVERSAL is found.

d2. But in a collection of individuals, only an enumeration formally complete can be truly called complete.

B. Therefore, by reason of their NOMINALISM, these MODERN writers, recognize as complete induction none other save that which is formally complete.

311. INCOMPLETE INDUCTION: This name 'incomplete induction':

A. As understood by these MODERN authors, includes that induction which the ancients called virtually complete.

B. But as understood by the ANCIENTS, is restricted to an induction:

a. with an insufficient enumeration of parts, (i.e. not even virtually complete),

b. and therefore illegitimate.

312. SCHEMATIC CONTRAST: The contrast between the terminology of the ancients and scholastics on the one hand and that of modern authors on the other hand, is thus exhibited schematically:-

	COMPLETE	formally.	....	COMPLETE induction.	
Induction is divided by the ancients and scholastics into induction which is		virtually (Scientific induction	.... to which correspond in the language of the moderns	.... INCOMPLETE induction, in which the parts are enumerated	sufficiently (Scientific induction).
	INCOMPLETE or in which the parts are INSUFFICIENTLY enumerated.....		....		insufficiently.

....

ARTICLE THREE.

IMPERFECT INDUCTION.

313. REASONING BY RESEMBLANCE OR BY ANALOGY: Whereas in every perfect induction, the mind rises from an enumeration of singulars or particulars to a UNIVERSAL conclusion (n.305).

A. In imperfect induction on the contrary, the mind passes from one or several singular facts (or from a particular enunciation) to another SINGULAR or PARTICULAR enunciation which it infers in virtue of a resemblance. (Cf. Analyt. Post. I, c.1, 71 a. 10; Comment. S.Thomae, lect.1, 1.n.12).

a. Let us take these examples:

a1. 'Paul was cured of his headaches by this medicine.
Therefore John will be cured of his headaches by this same medicine'.

a2. 'Abscesses in human being are healed by penicillin.
Therefore mastitis in cows will be healed by penicillin'.

b. This reasoning is not an irreducible species of reasoning, but rather is reduced to induction as the imperfect to the perfect.

b1. And indeed:

b1a. Though this reasoning by resemblance may be resolved into a complex reasoning, to wit, into induction (by insufficient enumeration) and a syllogism, thus:

INDUCTION
'James was cured of his rheumatism by this treatment.
Therefore everyone suffering from rheumatism will be cured by this treatment.

But Henry is suffering from rheumatism. SYLLOGISM .

Therefore Henry will be cured by this treatment'.

b1b. Nevertheless, the mind concludes from the singular (or particular) to the singular (or particular), not by means of a universal law, but by means of the resemblance between the two cases:

b1b1. Thus:

'James was cured of his rheumatism by this treatment.
But Henry's case resembles James' case.
Therefore Henry will be cured of his rheumatism by this treatment'.

b1b2. Here the mind passes only from singular to singular, not to the universal whereof the subject of the major is a subjective part:

b1b2a. the reason being that in the minor the mind does not ascend to that universal, but only to something less proper and most common as a reason of argument, to wit, to a resemblance - which indeed is a universal whereof the two cases are subjective parts (for each 'resembles'), - without knowing whether the two subjects (James and Henry) are, in regard to the predicate ('cured by this treatment') contained under a same universal REASON.

b2. Therefore:

b2a. Reasoning by resemblance is not an example of what John Stuart Mill and other Nominalists call "an inference from the particular to the particular", as if no universal played any part.

b2b. For there is NO INFERENCE FROM THE PARTICULAR TO THE PARTICULAR without the mediation of a universal, but only association, and indeed:

b2b1. in the sensible order association of IMAGES,

b2b2. and in the intelligible order association of CONCEPTS or IDEAS.

b2c. But rather, in reasoning by resemblance inference is made in virtue of a universal, to wit, 'resemblance'.

B. This kind of reasoning:
a. Yields only a probable conclusion, for the reason given above (A, b1b2a).
b. Yet:
b1. it plays an immense role in discovery or invention.
b2. nevertheless in order that certitude be had in scientific judgment recourse must be had to a perfect kind of reasoning (to wit, either to the syllogism or to induction with sufficient enumeration).

314. DISTINCTION BETWEEN REASONING BY ANALOGY AND ANALOGICAL KNOWLEDGE:
It is OF THE HIGHEST IMPORTANCE to avoid confusing 'reasoning by analogy' (i.e. reasoning by resemblance), with which we are here concerned, with analogical knowledge.

A. In reasoning by analogy, the analogy, which designates a more or less accidental resemblance, has reference to a manner of establishing a conclusion, that is, to a PROBABLE INFERENCE OR ILLATION of which it is the foundation.

B. But in analogical knowledge:
a. the analogy has reference to a CONCEPT and to the thing which the concept represents;
b. and it is, at least in analogy of proper proportionality (cf. n.153), an intrinsic property of the concept;
c. Therefore, if one analogate is immediately known by us, then the knowledge which we can have of the other analogate, which is only analogically known:
c1. though imperfect,
c2. yet remains CERTAIN.

315. EXAMPLE AND COMPARISON: An example or comparison:

A. Is scarcely even a most imperfect reasoning by resemblance.

B. And its purpose is to illustrate and make more sensibly manifest some proposition, - not to infer it.

C. And the truth of the proposition is utterly independent of the examples or comparisons employed to illustrate it.

D. And the goodness of an example is derived:
a. not from its truth in itself,
b. but from its aptitude to manifest or render more clear the proposition which it is used to illustrate.

……………………………………

SCHEMATIC SUMMARY.

316. SCHEMATIC SYNOPSIS: The contents of the fore-going section on induction may be thus synoptically presented:-

On induction
- PROPERLY SO-CALLED
  - Its nature
    - It is not reduced
      - to a syllogism of the third figure: as say Lachelier and Goblot.
      - to an enthymeme: as says Wolf.
    - But it differs ESSENTIALLY from the syllogism:
      - There is no middle term.
      - It passes from subjective parts to the universal.
  - Its division
    - Complete (formally).
    - Incomplete
      - sufficient (virtually complete).
      - insufficient.
- IMPROPERLY SO-CALLED
  - Analogy (by resemblance).
  - Example.

……

SECTION FOUR.

……

SOPHISTIC PROOF.

……

317. ORDER OF PROCEDURE: Since here we begin MATERIAL LOGIC (n.252), this section:

A. Will deal:
a. *First*, with pre-ambles to material logic.
b. *Secondly*, with sophistic proof.

B. Hence the following order:-

Section four
- Pre-ambles to material logic..............Chapter twenty-seven.
- Sophistic proof..........................Chapter twenty-eight.

……

CHAPTER TWENTY-SEVEN.

PRE-AMBLES TO MATERIAL LOGIC.

318. CONNEXION WITH THE FORE-GOING: In sections II-III we have dealt with reasoning as it is ILLATION: which is the consideration of the form only of reasoning.

A. But now we must treat of reasoning as it is PROOF: which consideration is MATERIAL LOGIC, and regards:
a. not only the FORM,
b. but also the MATTER of the reasoning.

B. But reasoning, as it is proof or argument, is ordered towards TRUTH, i.e. towards adequation or conformity of intellect with thing.

C. But relatively to truth, the human intellect has itself in diverse ways:
a. For:
a1. Either it NEITHER possesses NOR SEEKS the truth: and then its state is nescience or IGNORANCE.
a2. Or it does NOT possess the truth, and ABSTAINS from having the truth: and then its state is DOUBT.
a3. Or it does NOT possess the truth, and yet INCLINES towards it: and then its state is SUSPICION.
a4. Or it does NOT possess the truth, though it SAYS THAT IT HAS it: and then its state is ERROR.
a5. Or it POSSESSES the truth, yet imperfectly only: and then its state is OPINION.
a6. Or it POSSESSES the truth, and indeed perfectly: and then its state is CERTITUDE.
b. Which may be thus shown schematically:-

Relatively to a truth the human intellect has itself in diverse ways, according as
- either it DOES NOT POSSESS the truth
  - and does NOT SEEK it................IGNORANCE.
  - and WITHHOLDS ITSELF from it.........DOUBT.
  - and yet INCLINES towards it..........SUSPICION.
  - and yet SAYS THAT IT HAS it..........ERROR.
- or POSSESSES the truth
  - yet imperfectly only..............OPINION.
  - and indeed perfectly..............CERTITUDE.

D. But reasoning, as it is proof:
a. has no place:
a1. in those states in which there is NO ADHESION of the mind, to wit:
a1a. in nescience or ignorance,
a1b. in doubt,
a1c. in suspicion.
a2. in those things also to which the mind adheres WITHOUT PROOF.
b. For reasoning, as it is proof, has place only where there is ADHESION of the mind THROUGH PROOF.

319. THREEFOLD GENUS OF REASONING AS IT IS PROOF: Therefore reasoning, as it is proof, is reduced to three genera; to wit:

A. Sophistic proof: which is dealt with in the present section.

B. Probable proof, which will be dealt with in the next section.

C. Certain or scientific proof, or demonstration, which will be dealt with in the remaining sections.

……

CHAPTER TWENTY-EIGHT.

SOPHISTIC PROOF.

320. ORDER OF PROCEDURE: This chapter:

A. Will consider:
a. First, sophistic proof in general.
b. Secondly, sophisms or fallacies in special: and indeed:
b1. in the first place, will be treated sophisms arising from vocables;
b2. in the second place, will be treated sophisms arising from things signified.
c. Thirdly, the teaching of modern writers regarding sophisms.

B. Hence the following order:-

On sophistic proof:
- Sophistic proof in general..................Article one.
- Sophisms in special
  - in diction.............Article two.
  - outside diction.........Article three.
- Teaching of moderns regarding sophisms.......Article four.

……

ARTICLE ONE.

SOPHISTIC PROOF IN GENERAL.

321. DISTINCTION OF SOPHISTIC PROOF FROM PARALOGISM: From sophistic proof:

A. Must be distinguished PARALOGISM, which is a syllogism consisting of true premisses, but offending in form.

B. In which case:
a. there is no consequence,
b. and therefore no proof.

C. As an example of a paralogism:
a. Let us take this:

'Some animals are mammals.
But every cow is an animal.
Therefore every cow is a mammal'.

b. In which:
b1. each proposition is true,
b2. but there is no consequence, because M is not once universal.

322. DISTINCTION OF SOPHISM FROM SIMPLY ERRONEOUS PROOF: Likewise sophistic proof:

A. Must be distinguished from a simply ERRONEOUS proof, which is:
a. a good argumentation,
b. consisting of **premisses evidently false.**

B. As an example of a simply ERRONEOUS proof:
a. Let us take this:

'Every animal is a man.
But every plant is an animal.
Therefore every plant is a man".

b. In which:
b1. there is no defect inform,
b2. but each of the propositions is evidently false.

323. NOTION OF SOPHISM: A sophism, though in it there is good consequence, nevertheless PROCEEDS FROM FALSE PREMISSES WHICH SEEM TO BE TRUE.

324, TWO GENERA OF SOPHISMS: Sophisms or fallacies may arise:

A. FROM THE LANGUAGE (VOCABLES) namely, when from unity of vocable is false inferred unity of thing: these are called FALLACIES IN DICTION.

B. FROM THE THINGS SIGNIFIED, namely, when some things IN SOME WAY agreeing or differing are taken as if they were SIMPLY the same or diverse: these are called FALLACIES OUTSIDE DICTION.

……………………………………

ARTICLE TWO.

SOPHISMS OF FALLACIES IN DICTION.

325. SOME EXAMPLES: Let us take these examples:

A. 'Every spirit is an immaterial substance.
But whisky is a spirit.
Therefore whisky is an immaterial substance.'

B. '"The duke yet lives that Henry shall depose". (Shakespeare HenryV).
But Henry is king of England.
Therefore a king of England shall depose a duke who still lives'.

C. 'He who cannot be standing upright, has not the power to stand upright.
But one who is lying down cannot be standing upright.
Therefore one who is lying down has not the power to stand upright'.

D. 'A senator who, bidden to apologise for having called another senator a contemptible liar, says: "I called him a contemptible liar; it is true; I am sorry for it," makes a good apology.
But senator X said this, when bidden to apologise for having called senator Y a contemptible liar.
Therefore senator X made a good apology.

E.

a. 'John ate the meat which Judith bought.
But the meat which Judith bought was raw meat.
Therefore John ate raw meat'.

b. 'What Napoleon was, Nelson was not.
But Napoleon was a man.
Therefore Nelson was not a man'.

326. DIVERSE SOPHISMS: In all the above examples there are sophisms which accord in this, that they all ISSUE FROM THE LANGUAGE, though in diverse ways:

A. In the first example (n.325, A):

a. the sophism arises FROM THE TAKING OF THE SAME TERM (spirit) WITH DIVERSE SIGNIFICATION.

b. This fallacy is called EQUIVOCATION.

c. Whereof another example:

c1. is this:

'All who die without baptism perish eternally.
But all Jews, Mohammedans and heathens die without baptism.
Therefore all Jews, Mohammedans and heathens perish eternally'.

c2. Wherein:

c2a. the major is true only if 'baptism' is taken broadly to include, not only baptism of water, but also baptism of charity and of blood;

c2b. but the minor is true only if 'baptism' is taken narrowly to include only baptism of water.

B. In the second example (n.325, B):

a. the sophism arises FROM AMBIGUITY, not of a term, but OF A SPEECH - phrase or clause of proposition (cf. n.161); - for the clause 'that Henry shall depose' may be taken to signify:

a1. this: 'whom Henry shall depose',

a2. or this: 'who shall depose Henry'.

b. This fallacy is called AMPHIBOLOGY.

c. Whereof further examples:

c1. is this:

'Those horses are the bishop's.
But the bishops are priests.
Therefore those horses are priests'.

c2. and this:

'One who adds oil to a flame, must have oil.
But one who answers an angry man adds oil to the flame.
Therefore one who answers an angry man must have oil'.

C. In the third example (n.325, C):

a. the fallacy:

a1. arises from this:

a1a. that in the major 'he who cannot be standing upright' means 'when he is not lying down';

a1b. but the minor is true only 'when he is lying down'.

a2. But since 'be standing upright' and 'be lying down' are opposite, and cannot be together:

a2a. the major is true IN A DIVIDED SENSE (i.e. given division or separation from prostration): for he who cannot be standing upright when he is not lying down, has not the power to stand upright;

a2b. but the minor is true IN A COMPOSITE SENSE (i.e. given composition or conjunction with prostration), for one who is lying down cannot be standing upright when he is lying down.

b. This fallacy is called the FALLACY OF COMPOSITION AND DIVISION.

c. Other examples of this fallacy:

c1. is this:

'One who cannot be virtuous is not responsible for his evil acts.
But one who is frequently gravely sinning cannot be virtuous.
Therefore one who is frequently gravely sinning is not r[illegible]onsible
for his evil acts'.

c2. and this:

'Two and three are less than four.
But two and three are five.
Therefore five is less than four'.

D. In the fourth example (n.325, D):
a. the sophism arises FROM A VARIATION OF ACCENT (OR VOCAL INFLECTION) IN THE SAME VOCABLES: for that utterance of the senator has this or that meaning according to this or that inflection of voice.
b. Accordingly this fallacy is called FALLACY OF ACCENT OR OF PROSODY.

E. In the fifth (n.325, E.a) and sixth (n.325, E.b) examples: the fallacy arises FROM THE RESEMBLANCE OF ONE DICTION OR UTTERANCE WITH ANOTHER.
a. But:
a1. In the former the resemblance comes from this, that the SAME DICTION ('raw meat') signifies DIVERSE PREDICAMENTS:
a1a. and in the major is considered the substance of the thing bought.
a1b. whereas in the minor is considered its quality (raw).
a2. In the latter the fallacy arises from this:
a2a. that in the major 'Napoleon was' signifies INDIVIDUALITY,
a2b. whereas in the minor it signifies NATURE.
b. This fallacy is called FALLACY OF FIGURE OF DICTION.

....

ARTICLE THREE.

SOPHISMS OR FALLACIES OUTSIDE DICTION.

327. SOME EXAMPLES: Let us take these examples:

A.
a. 'What is behind the wall is not known to you.
But what is behind the wall is your motor-car.
Therefore your motor-car is not known to you'.

b. 'Man is risible.
But risible is a property.
Therefore man is a property'.

B. 'It is lawful to the sick to eat meat on Friday.
Therefore it is lawful to eat meat on Friday'.

C. 'Napoleon died at St Helena and did not die in Paris.
Therefore Napoleon died and did not die'.

D. 'He who was begotten by Aristo was the son of Aristo.
But Plato was begotten by Aristo, because he had Aristo as his father.
Therefore Plato was the son of Aristo'.

E.
a. 'If Peter is running, he is moved.
But Peter is moved.
Therefore Peter is running'.

b. 'If Peter is running, he is moved.
But Peter is not running.
Therefore Peter is not moved'.

F.

a. 'The Roman Empire fell after the rise of Christianity.
Therefore the rise of Christianity was the cause of the fall
of the Roman Empire'.

b. 'That which excites hatreds is evil.
But the practice of virtue sometimes excites hatreds.
Therefore the practice of virtue sometimes is evil'.

c. 'To die and to live are contraries.
But to die is to be corrupted.
Therefore to live is to be generated'.

G. 'Have you ceased beating your wife?
No? Therefore you are still beating her.
Yes? Therefore you did beat her.'

328. DIVERSE SOPHISMS: The preceding are examples of sophisms OUTSIDE DICTION.

A. In the first (n.327, A.a) and second (n.327, A.b) examples the fallacies issue from this, that THOSE THINGS WHICH BEFIT (or do not befit) AN ACCIDENT ARE INFERRED TO BEFIT (or not befit) ITS SUBJECT, OR VICE VERSA.

a. In the former example (n.327, A.a) is predicated of 'your motor-car' what befits 'what is behind the wall' (corporal accidents).

b. In the latter example (n.327, A.b) of 'man' (subject having risibility) is predicated what befits 'risible' ('property').

c. This fallacy is called FALLACY OF ACCIDENT.

d. Further examples of this fallacy:

d1. is this celebrated one:

'You do not know what I am going to ask you.
But what I am going to ask you is your name.
Therefore you do not know your name.'

d2. And this:

'Mental activities are not had without cerebral processes.
Therefore mental activities are cerebral processes'.

d3. And this:

'The concept is not had without the sensible image.
Therefore the concept is the sensible image'.

B. In the third example (n.327, B):

a. The fallacy arises from this, that IT IS CONCLUDED FROM THIS THAT A CERTAIN PREDICATE BEFITS SOME SUBJECT IN A QUALIFIED SENSE (secundum quid) THAT IT BEFITS THAT SUBJECT SIMPLY, or in other words, it consists in confounding what is true simply speaking with what is true under qualification or restriction.

b. Wherefore this fallacy is called FALLACY FROM 'SECUNDUM QUID' TO SIMPLY.

c. Further examples of this fallacy:

c1. is this:

'The good save their souls.
But Milton was good (a good poet).
Therefore Milton saved his soul'.

c2. 'Ecclesiastical authorities put restraint upon a scientist.
Therefore ecclesiastical authorities are hostile to scientists'.

C. In the fourth example (n.327, C) the fallacy arises FROM FORGETFULNESS OF THE CONDITIONS OF CONTRADICTION.

a. For contradiction must be ABOUT THE SAME, TAKEN ACCORDING TO THE SAME and IN THE SAME WAY, and WITH RESPECT TO THE SAME, and AT THE SAME TIME, and IN THE SAME PLACE.

b. The example given offends from this, that the contradiction alleged does not concern the same place.

c. This sophism:

c1. is called IGNORING THE ISSUE ('ignoratio elenchi' - ignorance of contradiction or of refutation);

c2. and is committed whenever someone argues BESIDE THE POINT AT ISSUE, as when someone 'mistakes the question' or proves 'an irrelevant conclusion' or 'evades the issue': for then he deems himself to contradict, or professes to contradict, a difficulty which he in no way contradicts.

c3. This fallacy receives special names according as it is diversely practised:

c3a. It is called 'APPEAL TO THE MOB' (argumentum ad populum) when it consists in an appeal to the prejudices and passions of the people; as when someone strives to prove that communism is desirable by depicting vividly and harrowingly the sufferings of the poor and the rapacity and injustice of the rich.

c3b. It is called 'APPEAL TO MIGHT' (argumentum ad baculum) when it is an endeavour to prove that some doctrine is false from prophecies and threats of evil to those who hold it; thus:

> 'If you say that this war is unjust, you will have the whole country up in arms against you.
> Therefore this war is not unjust'.

c3c. It is called 'APPEAL TO SHAME' (argumentum ad verecundiam) when it consists in trying to prove some doctrine from this, that to deny that doctrine would involve the shame of being in opposition to men of eminence or authority; as when someone argues thus:

> 'All the eminent biologists of the world hold the doctrine of transformism.
> Therefore the doctrine of transformism is true'.

c3d. It is called 'APPEAL TO PITY' (argumentum ad misericordiam) when it consists in playing upon the 'heart-strings' of the listeners, as when an advocate appeals to the pain that a conviction would cause in the parents and relatives of the accused.

c3e. It is called an 'APPEAL TO IGNORANCE' (argumentum ad ignorantiam) when it relies upon the ignorance of the hearers.

c3f. It is called an 'APPEAL TO THE INDIVIDUAL' (argumentum ad hominem) when it shows from the adversaries' previous deeds or utterances that he is not an apt proponent of a certain doctrine.

D. In the fifth example (n.327, D):

a. there is had a BEGGING OF THE QUESTION (petitio principii):

a1. which is the ASSUMPTION OF WHAT IS TO BE PROVED AS A PRINCIPLE OF THE PROOF;

a2. which is called 'petitio principii' (borrowing of a principle) because the principle of the proof is borrowed from the conclusion.

b. Aristotle distinguishes five ways in which this fallacy may be committed, to wit:

b1. By assuming as a principle of proof the very proposition which is to be proved, - which is usually done under cover of synonyms, thus:

> 'An upper chamber is an anachronism.
> Therefore the House of Lords is out of date'.

b2. By assuming, for the proof of a particular conclusion, a principle which itself cannot be known save through a knowledge of that particular; thus:

> 'All the inhabitants of town X perished in the tidal wave.
> But James was an inhabitant of town X.
> Therefore James perished in the tidal wave'. (Cf. n.272, B.d1a1)

b3. By assuming, for the proof of a universal conclusion, a particular proposition which itself cannot be known save through a knowledge of that universal; thus:

'All past men, and all present men, and all future men, are mortal.
Therefore every man is mortal'.

b4. By assuming successively, part by part, the conclusion which is to be proved; thus:

'The art of medicine is a knowledge of what is healthy.
But the art of medicine is a knowledge of what is unhealthy.
Therefore the art of medicine is a knowledge of what is healthy
and unhealthy'.

b5. By assuming, without independent evidence, a proposition which is the correlative of the conclusion to be proved; thus:

'Aristo was the father of Plato.
Therefore Plato was the son of Aristo'.

c. NOTE that:

c1. When the begging of the question is immediate or done by a single step of inference, it is called HYSTERON PROTERON (later-earlier). Such are all the examples given above.

c2. But when the begging of the question is mediate, i.e when the conclusion is proved from the principle, and the principle is in turn proved from the conclusion, then it is called a VICIOUS CIRCLE or ARGUING IN A CIRCLE. Thus Plato:

c2a. in his 'Phaedo' proves the immortality of the soul from its simplicity,

c2b. and in his 'Republic' proves the simplicity of the soul from its immortality.

E. In the sixth (n.327, E.a) and the seventh (n.327, E.b) examples:

a. The fallacy arises from this, that IT IS THOUGHT THAT THE ANTECEDENT FLOWS FROM THE CONSEQUENT JUST AS THE CONSEQUENT FROM THE ANTECEDENT, AND THAT THE NEGATION OF THE CONSEQUENT FLOWS FROM THE NEGATION OF THE ANTECEDENT JUST AS THE NEGATION OF THE ANTECEDENT FLOWS FROM THE NEGATION OF THE CONSEQUENT.

b. This fallacy is called the FALLACY OF CONSEQUENT.

c. As a further example of this fallacy, take this:

'If sovietism is a good form of government, it will survive.
But it survives.
Therefore it is a good form of government'.

F. In the eighth (n.327, F.a), ninth (n.327, F.b) and tenth (n.327, F.c) examples:

a. The fallacy arises FROM THE ASSUMPTION AS A CAUSE OF SOME CONCLUSION THAT WHICH IS NOT REALLY THE CAUSE OF IT.

b. This fallacy is called the FALLACY OF NON-CAUSE AS CAUSE, or of FALSE CAUSE.

c. Which fallacy may be committed in diverse ways:

c1. By taking what merely precedes as a cause:

c1a. in which case the fallacy is called the fallacy of 'AFTER THIS, THEREFORE BECAUSE OF THIS' (post hoc, ergo propter hoc):

c1b. of which:

c1b1. the eighth example given is an example;

c1b2. and an example is had in the argument formerly used that since malarial fever is prevalent in swampy regions, it is caused by poisonous vapours arising from swamps.

c2. By taking a mere occasion as a cause, as in the ninth example given.

c3. By taking a premiss:

c3a. as the cause of a conclusion, when it is not really the cause of it, as in the tenth example given: for the major there is not the cause of the conclusion, since death and life are not contrarily, but privatively, opposite. (Cf. n.57, C.d).

c3b. erroneously as the cause of the falsity of a conclusion, when this falsity is caused by another premiss:

c3b1. as in this celebrated example:

'If there were no time, there would not be night.
But if there were not night, there would be day.
But if there were day, there would be time.
Therefore, if there were no time, there would be time'.

c3b2. Where the falsity of the false and absurd conclusion is to be ascribed, not to the first proposition, but to the second.

G. In the eleventh example (n.327, G):
a. The fallacy arises from this that ONE SOLE ANSWER IS GIVEN TO A QUESTION WHICH CONTAINS SEVERAL INTERROGATIONS REQUIRING SEVERAL ANSWERS.
b. Which is called the FALLACY OF MANY QUESTIONS.

……

ARTICLE FOUR.

MODERN TEACHING REGARDING SOPHISTRY.

329. OTHER DIVISIONS PROPOSED: Modern authors propose other divisions of sophisms, - and divisions indeed which do not lack legitimacy, although they less profoundly exhaust the question than does the division proposed by the ancients.

330. CHIEF SOPHISMS AS ENUMERATED BY MODERN WRITERS: These are the following:

A. SOPHISM OF HYPOTHESIS, which is had when some gratuitous supposition or something repugnant to reason is taken FROM A PRECONCEIVED SYSTEM OR FROM PREJUDICE, as a foundation of reasoning. Examples are these:
a. 'Matter is eternal'.
b. 'All things are reduced to movement'.
c. 'Man took his origin from some ancestor which he has in common with the ape'.

B. SOPHISM OF INDUCTION, which is had when a universal law is concluded from an INSUFFICIENT induction.
a. Having affinity to this is the sophism of INCOMPLETE ENUMERATION, whereby:
a1. from one a conclusion is drawn about all,
a2. or something which avails only as regards certain parts is asserted about the whole.
b. Examples are:
b1. this:

'Certain religious are not virtuous.
Therefore no religious are virtuous'.

b2. and this:

'Part of man (his body) perishes.
Therefore the whole of man perishes'.

C. SOPHISM OF ANALOGY:
a. which has affinity with that which has been named above (n.328, B) "from what is said 'secundum quid' to what is said simply";
b. and is a sophism whereby it is asserted that things having some resemblance and proportion agree simply and in every respect.

D. PASSAGE FROM GENUS TO GENUS, which is a sophism whereby PRINCIPLES AND FACTS OF SOME ORDER ARE ABSOLUTELY AND WITHOUT REASON APPLIED TO ANOTHER ORDER QUITE DIVERSE. Examples are:

a. 'A miracle does not occur through the forces of nature.
Therefore a miracle does not occur through supernatural power'.

b. 'A law which avails in the mechanical order, avails also in the vital order'.

331. OTHER SOPHISMS AS ENUMERATED BY MODERN WRITERS: To those chief sophisms others are to be added:

A. SOPHISM OF AUTHORITY, whereby some doctrine is confirmed by a fictitious authority, - fictitious at least in regard to the question under dispute, - as when the pronouncements of eminent physicists or biologists are alleged in regard to a philosophical question, as if they spoke with authority regarding it.

B. SOPHISM OF BRILLIANCE, whereby minds are deceived by SUAVITY of speech or by BRILLIANCE, RICHNESS AND ELOQUENCE OF EXPOSITION.

C. SOPHISM OF LEARNING, whereby belief is more readily given to some man BECAUSE OF THE VASTNESS OF HIS LEARNING.

D. SOPHISM OF THE CATCH-WORD or CATCH-CRY or SLOGAN or SMART SAYING, whereby false doctrine is inserted into minds by means of an epigrammatic generalization, neatly and powerfully expressed, as in a 'smart saying'.

E. SOPHISM OF SUPPRESSION or of 'EX PARTE' STATEMENT, which is practised when about some question those things alone are said which favour one's own opinion, other things being omitted.

F. SOPHISM OF SUGGESTION OF THE FALSE, which is practised, when through innuendo or insinuation or by taking advantage of association of images and of concepts, false conclusions are suggested.

G. SOPHISM OF DISTRACTION, which is had when true and false statements, certain and uncertain propositions, considerations various and unrelated, are intermingled together in an entangled and tortuous speech or writing.

332. DIVISION PROPOSED BY MALEBRANCHE: Malebranche proposed a reduction of all sophisms:

A. To five, to wit:
a. ERRORS OF THE SENSES.
b. ERRORS OF IMAGINATION.
c. ERRORS OF UNDERSTANDING.
d. ERRORS OF INCLINATION, such as:
d1. anxiety,
d2. curiosity,
d3. greed for wealth,
d4. ambition for honour.
e. ERRORS OF THE PASSIONS.

B. But this is rather a division of the causes of fallacies than of fallacies themselves.

333. DIVISION PROPOSED BY THE LOGICIANS OF PORT-ROYAL: These logicians:

A. Distinguished:
a. Sophisms arising from SUBJECTIVE CAUSES, which are twofold:
a1. sophisms of self-interest or of self-love,
a2. sophisms of passion.
b. And sophisms arising from the OBJECTS THEMSELVES.

B. But this division, like the preceding, divides the causes of sophisms rather than sophisms themselves.

....

SCHEMATIC SUMMARY.

334. SYNOPTIC RECAPITULATION: The contents of the fore-going treatment of sophistry may be thus summarized schematically:-

- On sophistic
  - Its NATURE
    - It is not
      - a paralogism.
      - a simply erroneous argument.
    - It is
      - a good argumentation,
      - from premisses false, but apparently true.
  - Its DIVISION
    - Classical
      - FALLACIES IN DICTION
        - EQUIVOCATION.
        - AMPHIBOLOGY.
        - OF COMPOSITION AND DIVISION.
        - OF ACCIDENT OR OF PROSODY.
        - OF FIGURE OF DICTION.
      - FALLACIES OUTSIDE DICTION
        - OF ACCIDENT.
        - FROM 'SECUNDUM QUID' TO SIMPLY.
        - IGNORING THE ISSUE.
        - BEGGING THE QUESTION.
        - OF CONSEQUENT.
        - OF FALSE CAUSE.
        - OF MANY QUESTIONS.
    - Modern
      - OF HYPOTHESIS.
      - OF INDUCTION.
      - OF ANALOGY.
      - FROM GENUS TO GENUS.
      - Others, to wit:
        - OF AUTHORITY.
        - OF BRILLIANCE.
        - OF LEARNING.
        - CATCH-WORD, SMART SAYING.
        - SUPPRESSION OF THE TRUE.
        - SUGGESTION OF THE FALSE.
        - OF DISTRACTION.

……

SECTION FIVE.

PROBABLE PROOF.

CHAPTER TWENTY-NINE.

PROBABLE OR DIALECTIC PROOF.

335. ORDER OF PROCEDURE: This treatment of probable or dialectic proof:

A. Will deal:

a. First, with the nature of probable proof.

b. Secondly, with the two probable or dialectic syllogisms, to wit, the enthymeme and the epicheireme.

c. Thirdly, with the principles of the probable syllogism.

B. Hence the following order:-

On probable or dialectic proof:
- Its nature..............................Article one.
- Its twofold syllogism....................Article two.
- The principles of its syllogism..........Article three.

....

ARTICLE ONE.

NATURE OF PROBABLE PROOF.

336. NATURE OF OPINION: When the human mind begins to hold a truth, yet imperfectly, i.e. with fear of error, it is said to OPINE or to be of opinion.

A. For "OPINION signifies the ACT OF OUR INTELLECT WHICH IS BORNE TO ONE SIDE OF A CONTRADICTION, WITH FEAR OF THE OTHER." (I, q.79, a.9, ad 4).

B. But this notion of opinion is to be rightly understood:

a. Opinion indeed:

a1. formally consists IN AN ASSENT of the intellect; because the intellect in opinion is "TOTALLY" (cf. Post. Anal. I, 1, n.6) borne to one side of a contradiction;

a2. and in this opinion differs from suspicion, in which:

a2a. the mind is inclined, WITHOUT ASSENT, to one side of a contradiction,

a2b. the other side of the contradiction NOT BEING TOTALLY relinquished.

b. But this assent which is had in opinion is given through a certain VOLUNTARY choice (II-II, q.1, a.4), which moves the intellect AS REGARDS SPECIFICATION, not as regards exercise only.

b1. In every adhesion of the intellect, the will moves the intellect to exercise, that is, that the intellect be applied to the object FOR THE PERCEIVING OF THE EVIDENCE; but when this evidence is perceived, the intellect adheres WITHOUT ANOTHER INTERVENTION of the will.

b2. But if evidence is lacking, then the will again intervenes to determine the ADHESION (i.e. to determine the intellect to adhere): this is an intervention as regards specification.

b3. And indeed:
b3a. the will efficiently causes the choice of the side to be adhered to,
b3b. but together (in time) the object, apprehended by the intellect as worthy to be adhered to or ap-proved (probable), SPECIFIES the very choice of the will:
b3c. and thus:
b3c1. the adhesion of the intellect in opinion is immediately specified by the choice of the will,
b3c2. which choice itself is specified by the object apprehended by the intellect.
b3d. And therefore in opinion, the choice:
b3d1. is immediately specified by the will,
b3d2. but is mediately specified by the object of the intellect, and depends upon this object.

b4. But on account of the defect of evidence and the intervention of the will, the adhesion of the intellect in opinion is free; (note that we say:
b4a. "free",
b4b. not "arbitrary" or "motiveless" or "capricious": for these are precluded by the dependence of the adhesion on the object.)

c. THEREFORE, in spite of what many authors, who forget this objective dependence, say, it is impossible:

c1. That the same intellect have together two opinions about the same;
c1a. for example: 'this war is unjust' and 'this war is just'.
c1b. and therefore:

c2. That the intellect have an opinion based on less probable motives, while more probable motives (for the opposite side of the contradiction) stand.
c2a. But note that we say "based on less probable MOTIVES", not "based on reasons objectively less".
c2b. For the object is here considered, not as specifying the intellect, but as specifying the WILL.
c2b1. But the will is specified by the object as this is presented to the will as good.
c2b2. But no object is presented to the will as good save through relation to the will, that is, according to the subjective dispositions of the will;
c2b3. and therefore the motives specifying the choice of the will retain a greater or less subjectivity, according as the will is less rightly or more rightly disposed.

d. But when it is said that in opinion there is fear of the other side of the contradiction, this does not signify: 'on account of the OPPOSITE REASONS existing', but rather: 'on account of the DEBILITY OF THE OBJECT of adhesion', which is CONTINGENT. (Cf. Post. Anal. I, 44, n.3ss).

d1. For, since in opinion, the FEAR of the other side is ACTUAL:
d1a. it must be produced by ACTUAL causes.
d1b. But the opposite reasons:
d1b1. since they are totally relinquished, - as they are, because the intellect is totally borne to the opposite side, -
d1b2. remain only IN POTENCY, and THEREFORE CANNOT PRODUCE ACTUAL FEAR.

d2. But on the other hand, the CONTINGENCY of the inevident object, to which the intellect adheres in opinion:
d2a. is ACTUAL,
d2b. and therefore CAN PRODUCE ACTUAL FEAR. (Cf. Richard: La probabilite morale et la philosophie, c.II, pp.45ss).

337. DEFINITION OF PROBABLE PROOF: Bearing in mind what has been said regarding the nature of opinion:

A. We can describe PROBABLE PROOF as:
a. An ARGUMENTATION WHICH CAN GENERATE OPINION ONLY,
b. or a SYLLOGISM MAKING ONE OPINE.

B. But its ESSENTIAL DEFINITION is: AN ARGUMENTATION WHICH INFERS A CONCLUSION FROM PREMISSES OF WHICH ONE, OR BOTH, IS MERELY PROBABLE.

a. It is sufficient indeed that one premiss be only probable, in order that the conclusion be impeded from having certitude; since the conclusion of every syllogism follows always the weaker part.

b. But:
b1. just as the object of opinion, as said above (n.336, B.b), is that which is worthy to be ap-proved, or the CONTINGENT,
b2. so "probable premiss" MEANS THE SAME AS CONTINGENT (i.e. which might be not true).

338. NOTION AND DIVISION OF THE CONTINGENT: Accordingly here it is necessary to explain the notion and division of the contingent.

A. CONTINGENT is THAT WHICH CAN HAVE ITSELF OTHERWISE.

B. But the contingent is twofold, to wit:
a. The ONTOLOGICAL contingent,
b. the contingent BY MANNER OF ACCEPTATION.

C. The ONTOLOGICAL contingent is that which is contingent by contingency of the very THING itself; or, in other words, something is ontologically contingent when the very thing itself might be otherwise. But this is twofold, to wit:

a. The contingent with positive - though not necessary - determination, or the NATAL contingent (contingens NATUM), which has in the subject an innate cause, such as:
a1. The innate or acquired inclinations of our nature: and thus contingent are these propositions: 'Parents love their children' and 'Mathematicians multiply correctly'.
a2. The laws of nature: and thus contingent are these propositions: 'Men do not live for ten years without taking food', and 'Men are killed by being boiled in oil'.

b. The contingent to either (contingens ad utrumlibet), which is found in things according to MATERIAL cause, as water is contingent to hot or cold, and as plasticene is contingent to this shape or that. (Cf. Albert the Great: Metaphys. l.VI, tract.II, c.3). Hence if one of the possibles which are in the potency of a material cause is actuated, there arises a contingent WHICH IS-IN (quod inest), v.g. heat in water, or cubeness in plasticene. Such is the contingency of the human will. And to this contingent is reduced the contingent OF THINGS or of phenomena.
b1. Hence this contingent is found in the natural sciences which do not abstract from matter: thus contingent or probable is this proposition 'every metal conducts electricity'.
b2. To opinion also pertain certain judgments of in-be HERE AND NOW, (v.g. 'I am thirsty', 'I am hungry').

D. But the contingent ACCORDING TO MANNER OF ACCEPTATION is found in matter ontologically necessary, when it is known only through a medium not necessary in the order of knowledge.
a. In other words, something is contingent according to manner of acceptation:
a1. when the THING itself is necessary,
a2. but the medium through which we know it does not manifest its necessity, but manifests it as worthy to be ap-proved, yet leaving room for fear that it might not be so.
b. Contingent according to manner of acceptation (i.e. not according to the thing itself, but according to our knowledge of it) is every universal proposition which is not apodictically or evidently proved.

……

ARTICLE TWO.

THE TWO PROBABLE OR DIALECTICAL SYLLOGISMS.

339. ENTHYMEME AND EPICHEIREME: The two probable or dialectical syllogisms are the enthymeme and the epicheireme.

A. These have been spoken of above:
a. where it was explained that:
a1. the enthymeme is a syllogism whereof one premiss is left unexpressed (n.294, C);
a2. the epicheireme is a syllogism in which one premiss, or each of the premisses, contains its proof (n.296).
b. But now we deal with them ON THE PART OF THEIR MATTER.

B. Though each of these syllogisms is found also in necessary matter, nevertheless:
a. because debaters and orators who speak of contingent things make great use of them,
b. they are rightly considered by Aristotle as probable syllogisms.

340. THE ENTHYMEME: The enthymeme, by reason of its matter is, according to Aristotle, distinguished from demonstration in this "that it draws a conclusion from likelihoods and from signs, but not from the proper principles of things". (Analyt. Priora, CXXVII).

A. For example, from the uttered likelihood: 'Parents love their children', this enthymeme is constructed:

'Parents love their children.
Therefore Sempronius loves his son Titus'.

B. "But now, because enunciations which are formed from likelihoods and signs, are not utterly certain, but contingent, or probable, therefore a syllogism which is composed from them begets probable knowledge. Accordingly it is clear that the enthymeme differs from the strict syllogism, not by reason of its form, but by reason of its matter:
a. "because the syllogism properly so-called or demonstrative syllogism proceeds from necessary principles, and therefore has a quite certain conclusion,
b. "but the enthymeme, since it is composed from probable enunciations, begets a probable conclusion.

C. "True it is,
a. "nevertheless, that that arises:
a1. "not from the nature of the enthymeme,
a2. "but rather from the utility of orators and debaters, whom it often suits to omit one or other premiss;
b. "wherefore Aristotle called the enthymeme also the oratorical syllogism." (Sanseverino: Instituiones seu Elementa Philosophiae, vol, I, p.108, n.148).

341. THE EPICHEIREME: "The epicheireme also by reason of its matter differs from the syllogism properly so-called, and on account of this reason it was by the same Aristotle called the dialectical syllogism.

A. "And indeed orators:
a. "just as sometimes in their arguments they omit some part, which can easily be understood without being expressed, and construct enthymemes,
b. "so sometimes to increase the force of their speech, support and expand the single parts with these and those reasons, and construct those argumentations, which we call epicheiremes.

B. "It is at once evident that the reasons which are added to the parts of the argument:

a. "are:
a1. "not new parts of the same argument; for it is impossible that some argument be composed from more than three parts,
a2. "but are new arguments;
b. "so that the epicheireme is constituted:
b1. "not from one argument,
b2. "but from several gathered into one aggregation." (Sanseverino: ibid. n.149).

....

ARTICLE THREE.

THE PRINCIPLES OF THE PROBABLE SYLLOGISM.

342. PROBABLE PRINCIPLES: The principles of which the premisses of a probable or dialectical syllogism consist are of two genera, to wit, mediate and immediate.

A. Principles MEDIATELY probable are those which themselves must be proved by means of a dialectical syllogism, which is based upon principles immediately probable.

B. But principles IMMEDIATELY probable are those which are taken from the diverse probable sources. ('topoi', 'loci').

a. These sources are either INTRINSIC (probable FROM THEMSELVES) or EXTRINSIC.

b. INTRINSIC sources are either probable IN THEMSELVES or probable FROM A SIMILAR.

b1. The PROBABLE IN ITSELF or what seems immediately probable:
b1a. seems probable either to all or not to all.
b1b. Here it is to be remembered that opinion extends itself to every contingent, and thus the immediate data of the senses is an object, not of science, but of opinion. (Cf. n.338, C.b2).
b1c. Hence:
b1c1. Among probables, which seem to all probable, are:
b1c1a. all immediate contingent data (v.g. that I am here and now thirsty);
b1c1b. those things which "immediately occur on the surface or in the externals of a thing" (v.g. that heavy black clouds lying at a low altitude are a sign of early rain: for such they are in common estimation).
b1c2. But probables which seem such, not to all, but to some, are those which "are not on the surface but in some fashion beneath the surface" (Albert the Great: Topic. lib.I, tract.I, c.II).
b1c2a. But if they are not so far beneath the surface that they cannot be apprehended by some without reasoning, they are probable to the wise only: v.g. many symptoms whereby physical or pathological facts are connected.
b1c2b. But if they are so far beneath the surface that they require art, they are known, not to all the wise, but to the more illustrious only.

b2. But the probable FROM A SIMILAR is:
b2a. either probable through analogy (cf. n.313), as when it is probable that James will be cured of his headache by this remedy, because Henry was cured of his headache by this remedy.
b2b. or through resemblance to a contrary, as when it is probable that Thomas who suffers from diabetes and does not take insulin will not be cured, because Paul who suffered from diabetes and took insulin was cured.

c. EXTRINSIC sources are the diverse arts and sciences, from which are had probable principles which are conclusions of some science or art.
c1. These probable principles are based ON AUTHORITY.
c2. For authority is the cause of the probability of what is probable:
c2a. not in itself,
c2b. but extrinsically.

343. SCHEMATIC SUMMARY: What has been said regarding the principles of the probable syllogism may be thus schematically recapitulated:-

Probable principles are
- either MEDIATELY probable.
- or IMMEDIATELY probable: these are taken
  - either from INTRINSIC sources, and are
    - either probable IN THEMSELVES, and then
      - either TO ALL.
      - or TO THE WISE only, and then
        - either TO ALL THE WISE.
        - or TO THE MORE ILLUSTRIOUS ONLY.
    - or probable FROM A SIMILAR, and then
      - either BY ANALOGY.
      - or THROUGH LIKENESS TO A CONTRARY.
  - or from EXTRINSIC sources: Authority according to arts and sciences.

……

SECTION SIX.

CERTAIN OR SCIENTIFIC PROOF, THAT IS, DEMONSTRATION, IN ITSELF.

344. ORDER OF PROCEDURE: The human mind, in knowing truth, can, progressing beyond probability, arrive at certitude, which is the most perfect state of mind with respect to truth.

A. Note that:

a. It pertains to defensive metaphysics to defend the value of our knowledge.

b. Here accordingly, we give attention only to the logical problem, for which consideration suffices the fact of certitude admitted by common sense.

B. Therefore:

a. having dealt with sophistic and probable proof,

b. we come now to deal with CERTAIN proof, which is called DEMONSTRATION.

C. As observed earlier (nn.239, 319), certain or scientific proof or demonstration will be treated in four sections as follows:

a. The present section will deal with certain or scientific proof IN ITSELF.
b. The seventh section will deal with the PREPARATION of scientific proof.
c. Thereafter will be treated the EFFECT of scientific proof, which effect is SCIENCE. Regarding which:
c1. Section eight will deal with science IN GENERAL.
c2. Section nine will deal with science IN SPECIAL.

D. The present section, dealing with demonstration in itself:

a. will expose:
a1. First, the nature of certain proof or demonstration.
a2. Secondly, the division of demonstration.

b. Hence the following order:-

On certain proof or demonstration	Its nature.................................Chapter thirty.
	Its division..............................Chapter thirty-one.

....

CHAPTER THIRTY.

....

NATURE OF CERTAIN OR SCIENTIFIC PROOF, or DEMONSTRATION.

....

345. NOTION OF CERTITUDE: Just as opinion, to which probable proof is ordered, is an ADHESION of the mind, so also is certitude, to which CERTAIN proof is ordered, an ADHESION of the mind.

A. But certitude differs from opinion in this, that certitude bespeaks the FIRMNESS of an adhesion excluding fear of erring.

B. But the fear of erring is excluded by the very firmness or NECESSITY OF THE OBJECT.

a. Wherefore, for certitude are required these three:
a1. NECESSITY OF THE THING, which cannot be otherwise: for example:
a1a. necessity of the identity between the sum of the angles of a euclidian triangle and the equal of two right-angles.
a1b. necessity of the diversity between the magnitudes of the angles of a scalene triangle.
a2. KNOWLEDGE by the intellect of this necessity: for the object is THE THING AS IT IS PRESENT TO THE MIND through knowledge,
a3. EXCLUSION OF FEAR of erring, and indeed:
a3a. not a subjective exclusion, i.e. an exclusion due to subjective causes, as in false or erroneous persuasions;
a3b. but an OBJECTIVE exclusion, that is, issuing from the object.

b. Which may be thus summarized schematically:-

Certitude is a FIRM ADHESION of the mind, for which are required:	NECESSITY OF THE THING	
	KNOWLEDGE by the intellect of this necessity.	
	EXCLUSION OF FEAR OF ERRING	not indeed subjective exclusion.
		but OBJECTIVE exclusion.

C. Therefore the genuine concept of certitude must be correctly distinguished from other improper acceptations of the term 'certitude'. For certitude can be taken IN THREE WAYS:

a. "Some certitude is of the object itself according to its real be or in relation to the divine intellect.
a1. "And such certitude can well be along with our opinion regarding such an object, as if, v.g. the Pope is really dead, but I only opine that he is dead.
a2. "And the reason is, because such certitude of the object offers nothing to the intellect. For, as far as the manner of judging is concerned, even if the Pope were alive, I would opine that he is dead.

b. "Another certitude can be considered solely on the part of a knower, who according to his temper without any probable reason wantonly adheres to some affirmation or negation.
b1. "And such (certitude) is rather a wanton inhesion of the one who assents, than true certitude, although the one who assents may say that he is most certain.
b2. "and in this fashion some heretics adhere more firmly to their errors - nay, more, they sometimes even suffer death for testimony of them - than to other truths.

c. "There is a THIRD CERTITUDE OF ASSENT WHICH IS EFFECTED FROM THE CERTITUDE OF THE OBJECT WHICH IS KNOWN AS CERTAIN UNDER A FORMAL CHARACTER THROUGH A LIGHT AND HABIT CERTAINLY AND INFALLIBLY INCLINING TO AN ASSENT TO THE THING WHICH THUS HAS ITSELF." (Bannez: Comment. in Summam Theol., I, q.1, a.5).
c1. This is the proper notion of certitude.
c2. and it is with certitude thus understood, leaving aside the other improper acceptations, that we are concerned here.

D. Accordingly, CERTITUDE, properly taken, is defined: THE STATE OF THE MIND ADHERING FIRMLY, OR WITHOUT FEAR OF ERRING, TO A TRUTH.

346. DEFINITION OF CERTAIN PROOF OR DEMONSTRATION: Accordingly certain proof or demonstration is proof which causes certitude properly taken, as exposed above.

A. And, since every proof is effected by means of premisses which are causes of the conclusion:
a. therefore certain proof or DEMONSTRATION can be described: a SYLLOGISM EFFECTING SCIENCE (syllogismus faciens scire).
b. For SCIENCE is CERTAIN KNOWLEDGE THROUGH CAUSES.

B. But DEMONSTRATION IS DEFINED, along with Aristotle: a SYLLOGISM CONSISTING OF (PREMISSES WHICH ARE) TRUE, FIRST AND IMMEDIATE, MORE KNOWN THAN, PRIOR TO, AND CAUSES OF, THE CONCLUSION; or, more briefly: a SYLLOGISM INFERRING A CONCLUSION FROM TRUE AND NECESSARY PREMISSES.

a. In the Aristotelic definition, those terms which are added, - to wit: "first and immediate", "more known" and "prior" - are nothing else than the general conditions of proofs:
a1. For in every proof, the premisses cannot be provable unto infinity; and therefore they must be indemonstrable, at least mediately.
a2. Likewise the premisses in every proof:
a2a. must be more known than the conclusion:
a2a1. whether according to themselves and to us,
a2a2. or at least to us;
a2b. because they are the medium whereby the conclusion becomes known.

b. Note moreover that certain proof or demonstration, like every proof:
b1. supposes a GOOD illation,
b2. and for that reason is it said of the premisses:
b2a. that they are CAUSES of the conclusion,
b2b. or that they INFER the conclusion.

347. THREE WAYS IN WHICH PREMISSES MAY BE NECESSARY: But since the formal and specific element of certain proof or demonstration is NECESSARY premisses, something further is to be said about necessary premisses. For in three ways can premisses be necessary, to wit:

A. When the predicate is said OF THE SUBJECT, EVERY AND ALWAYS (as 'risible' or 'endowed with senses' is said of every man and always).
a. For the conclusion of a certain proof or demonstration cannot have itself otherwise;
b. Therefore:
b1. the predicate must befit the subject every and always:
b1a. not only in the conclusion,
b1b. but also in the premisses;
b2. since the conclusion always follows the weaker part (n.249).

B. When P of the premisses is said 'PER SE' of S of the premisses (nn.229-230). Which is self-evident.

C. When UNIVERSALLY P is said of S, or 'PER SE' PRIMARILY, or ACCORDING TO THAT WHICH IT IS (secundum quod ipsum), i.e. convertibly. (Cf. n.230, C).

……

CHAPTER THIRTY-ONE.

DIVISION OF CERTAIN PROOF OR DEMONSTRATION.

348. DEMONSTRATION 'A PRIORI' AND 'A POSTERIORI': In every proof the premisses are the causes of the conclusion in the order of knowledge: for they EFFECT science or opinion.

A. But these causes in the order of knowledge:
a. may be together the causes in the ontological order,
b. or causes in the order of knowledge only.

B. Let us take:
a. this example:

'Every spiritual being is immortal.
But human soul is spiritual.
Therefore human soul is immortal'.

b. and this example:

'The world exists.
But the world does not exist without a cause.
Therefore a cause of the world exists.'

C. In both examples the premisses are the logical causes, or causes in the order of knowledge, of the conclusion. For the conclusions have evidence from the premisses.

D. Yet nevertheless the premisses have themselves otherwise in each in either example.

a. In the former M ('spiritual') is the ONTOLOGICAL cause, both of 'human soul', whereof it expresses the formal cause or nature, and of immortality which is a proper act of spirituality.
a1. Wherefore in this example the premisses are:
a1a. not only the logical causes of the conclusion,
a1b. but also the ONTOLOGICAL causes of it.
a2. But:

a2a. since causes are prior to effect,
a2b. such demonstration is called demonstration 'A PRIORI' or demonstration THROUGH CAUSES IN BE.

b. But in the latter example, M (existence of the world), is indeed the cause of the knowledge of the existence of a cause of the world, but is not the cause of the existence of that cause. For, if the cause of the world did not exist prior to the world, the world would not exist.
b1. Wherefore in this example, the cause of the knowledge of the conclusion:
b1a. IS NOT THE ONTOLOGICAL CAUSE of the existence of the cause of the world,
b1b. but is an EFFECT of the cause of the world.
b2. But:
b2a. since in the ontological order an effect is posterior to its cause,
b2b. such demonstration is called demonstration 'A POSTERIORI' or demonstration THROUGH EFFECT.

349. DIVISION OF 'A PRIORI' DEMONSTRATION: But let us further consider 'a priori' demonstration:

A. Let us take this example:

'A being composed from soul and body is mortal.
But man is composed from soul and body.
Therefore man is mortal'.

B. In this example, the major expresses the reason on account of which or wherefore beings are mortal, and this reason is employed as the MEDIUM of demonstration. Wherefore the demonstration not only tells that man is mortal, but tells also on account of which cause man is mortal. Therefore this demonstration is called DEMONSTRATION WHEREFORE (demonstratio propter quid - demonstration why).

a. This demonstration is had whenever the demonstration is made through a cause convertible with the effect, i.e. whenever the demonstration is made through a cause so related to the effect that together the cause infers the effect and the effect infers the cause (as, for example, in an equilateral quadrilateral the cause 'four equal angles' infers the effect 'equal diagonals', and together the effect 'equal diagonals' infers the cause 'four equal angles'; or as, for example, the cause 'composition from contraries' infers the effect 'corruptibility', while together the effect 'corruptibility' infers the cause 'composition from contraries'); or, again in other words, whenever the demonstration is made through a cause given which the effect must be had and without which the effect cannot be had.
a1. For then the cause is said of the effect:
a1a. either in the first manner of saying 'per se' primarily,
a1b. or in the second manner of saying 'per se' primarily,
a1c. or in the fourth manner of saying 'per se'.
a2. And then it manifests:
a2a. either its specific nature,
a2b. or its property,
a2c. or its proper act.
a3. And in each case is manifested the reason on account of which in the conclusion P befits S.

b. Therefore demonstration WHEREFORE (propter quid) is had:
b1. not only when the demonstration is wrought through a PROXIMATE cause, - as in the example given - ,
b2. but:
b2a. also:
b2a1. whenever the demonstration is wrought through a REMOTE cause,
b2a2. provided IT IS A CAUSE CONVERTIBLE WITH THE EFFECT.
b2b. Thus:
b2b1. 'every spiritual substance acts from free choice' can be assumed for demonstration wherefore, even though it is from a remote cause: for a spiritual substance acts not from itself, but by the medium of its faculties. (Cf. In Post. Anal., ed.Leonina, lib.I, c.13, lect. 25, nota t, p.239; p.234, nota b).

b2b2. As in this example:

'Every spiritual substance acts from free choice.
But human soul is a spiritual substan .
Therefore human soul acts from free choice'.

c. "But it is to be known that when in demonstration" (wherefore) "a passion is proved about a subject through a medium, which is the definition, it must needs be that the first proposition, whose predicate is the passion and whose subject is the definition, which contains the principles of the passion, be 'per se' in the fourth mode; but the second proposition whose subject is the subject itself and whose predicate is the definition itself, (must needs be) in the first mode. But the conclusion, in which the passion is predicated of the subject, is 'per se' in the second mode." (In Post. Anal. lib.I, c.VI, lect.13).

c1. "Let, for example, what is to be demonstrated be that to man befits this passion or property, namely, capability of science, and let it be demonstrated in this way:

"'A rational animal is capable of science.
But man is a rational animal.
Therefore man is capable of science.'

c1a. "In this syllogism the medium assumed is rational animal: which is the definition of the subject, namely, of man, about which is to be proved, and is proved, the passion, namely, capability of science.

c1b. "Now in the first or major proposition the definition of the subject, namely of man, is the subject and the passion is the predicate.

c1c. "But in the second or minor proposition, the subject is that very subject of which the passion is to be proved and is proved, and the predicate is the definition itself.

c1d. "But:

c1d1. "the passion or capability of science is said in the major proposition about rational animal in the fourth manner of saying 'per se';

c1d2. "and it is said of man in the conclusion in the second manner of saying 'per se';

c1d3. "lastly in the minor proposition rational animal is said of man in the first manner of saying 'per se'." (In h.l., ed.Leonina, t.I, p.189, nota 2).

c2. In this demonstration the conclusion cannot be in the first manner of saying 'per se', for "since science is properly of conclusions,.......... what are properly called scientific knowables (scibilia) are the conclusions of demonstration, in which passions are predicated of their proper subjects. But proper subjects are not only placed in the definition of accidents, but also they are causes of them. Wherefore the conclusions of demonstrations include two ways of saying 'per se', to wit, the second and the fourth." (In Post. Anal. lect.10, n.8).

c2a. The predicate of a conclusion in the first manner of saying 'per se' would not be a proper passion of the subject, but its definition, and then there would not be in the conclusion another truth than in the premisses. So that the syllogism would be merely an EXPLICATIVE syllogism. (Cf. n.300; cf. Tonquedec: La Critique de la connaissance, p.524).

c2b. Similarly if the conclusion is in the second manner of saying 'per se', the major must be in the fourth manner; otherwise the conclusion would be a mere EXPLICATION of the major. (Cf. n.300).

C. But now let us take another example:

a. Let the example be this:

'Everything which ages is corruptible.
But a body ages.
Therefore a body is corruptible'.

b. Here there is not had demonstration wherefore (propter quid):

b1. because the demonstration is not wrought through proper cause convertible with the effect: - for the proper cause of corruptibility is not ageing, but composition from contrary elements - ;

b2. but it is wrought through a common cause.

c. In this case:
c1. the demonstration:
c1a. proves only that the predicate is in the subject, i.e. that corruptibility is in body,
c1b. but it does not tell on account of which cause; in other words, it does not tell why.
c2. And therefore such demonstration is called DEMONSTRATION THAT (demonstratio quia) or DEMONSTRATION THROUGH NON-CONVERTIBLE REMOTE CAUSE.

350. DIVISION OF 'A POSTERIORI' DEMONSTRATION: Let us take this example again:

> 'The world exists.
> But the world does not exist without a cause.
> Therefore a cause of the world exists'.

A. In this example we not only prove that the world has some cause, but that this cause is uncaused, and therefore that it agrees only analogically with the effect.

a. Then "it is legitimate to take only analogous concepts of the nature and perfections of the cause from the knowledge of the nature and perfections of the effect.

b. "Thus it happens in Theology. For creatures are distant unto infinity from God in perfections;
b1. "consequently knowledge of the perfections of creatures infers indeed the existence of perfections in God;
b2. "but because the perfections in God are of an infinite nature and the perfections of creatures are absolutely finite,............it follows that from creatures we can know about the perfections of God:
b2a. "that they are,
b2b. "but not what they are in themselves." (In Post. Anal. ed. Leonina, p.240, nota).

c. This 'A POSTERIORI' demonstration is called ANALOGOUS demonstration.

B. But 'a posteriori' demonstration is called UNIVOCAL "if the effect is univocal with its cause...........
a. "It can lead us to a knowledge, whether specific, or generic, of the nature of the cause, according as (the effect) agrees univocally in species or genus with the cause." (Ibid.).
b. Thus from the knowledge of a man is known the nature of his father.

351. DIRECT OR OSTENSIVE DEMONSTRATION AND INDIRECT DEMONSTRATION: The demonstration so far set forth in the examples given show that the predicate befits the subject, and for that reason they are called OSTENSIVE or DIRECT demonstrations, and they have place only with regard to propositions NOT SELF-EVIDENT (non per se notas).

A. But if we wish, by some demonstration, to manifest SELF-EVIDENT propositions (propositiones per se notas), we must employ INDIRECT, or APAGOGIC demonstration, also called demonstration THROUGH THE ABSURD, which shows through IMPOSSIBLE CAUSES or through IMPOSSIBLE EFFECTS that P befits S.

B. Accordingly:
a. INDIRECT or APAGOGIC demonstration is a demonstration which shows:
a1. that P befits S,
a2. from this, that if P did not befit S, then:
a2a. either there would be had:
a2a1. a CAUSE which cannot be had,
a2a2. or an EFFECT which cannot be had;
a2b. or there would not be had:
a2b1. a CAUSE which must be had,
a2b2. or an EFFECT which must be had.

b. Thus INDIRECT or APAGOGIC demonstration proceeds in these four ways, to wit:

b1. First way:
b1a. Thus:

> 'If effect is had, CAUSE IS HAD.
> But CAUSE CANNOT BE HAD.
> Therefore effect is not had.'

b1b. Whereof this is an example:

'If a square has unequal diagonals, IT HAS UNEQUAL ANGLES.
But IT CANNOT HAVE UNEQUAL ANGLES.
Therefore it has not unequal diagonals.'.

b2. Second way:
b2a. Thus:

> 'If cause is had, EFFECT IS HAD.
> But EFFECT CANNOT BE HAD.
> Therefore cause is not had.'

b2b. Whereof this is an example:

'If a square has unequal angles, IT HAS UNEQUAL DIAGONALS.
But IT CANNOT HAVE UNEQUAL DIAGONALS.
Therefore it has not unequal angles'.

b3. Third way:
b3a. Thus:

> 'If effect is not had, CAUSE IS NOT HAD.
> But CAUSE MUST BE HAD.
> Therefore effect is had.'

b3b. Whereof this is an example:

'If a square has not equal diagonals, IT HAS NOT EQUAL ANGLES.
But IT MUST HAVE EQUAL ANGLES.
Therefore it has equal diagonals'.

b4. Fourth way:
b4a. Thus:

> 'If cause is not had, EFFECT IS NOT HAD.
> But EFFECT MUST BE HAD.
> Therefore cause is had.'

b4b. Whereof this is an example:

'If a square has not equal angles, IT HAS NOT EQUAL DIAGONALS.
But IT MUST HAVE EQUAL DIAGONALS.
Therefore it has equal angles'.

C. Wherefrom it appears that INDIRECT or APAGOGIC demonstration may be:

a. either THROUGH CAUSES, and therefore 'A PRIORI', and even through causes convertible with the effect, so that it may even be demonstration WHEREFORE (propter quid): as in the first (B.b1) and third (B.b3) examples given above.

b. or THROUGH EFFECTS, and therefore 'A POSTERIORI'; as in the second (B.b2) and fourth (B.b4) examples given above.

……

SCHEMATIC SUMMARY.

……

352. SCHEMATIC SYNOPSIS: Accordingly, the contents of the fore-going section may be thus schematically summarized:-

On scientific proof or demonstration
- Its NATURE
  - It is described: SYLLOGISM EFFECTING SCIENCE.
  - It is defined: SYLLOGISM INFERRING A CONCLUSION FROM TRUE AND NECESSARY PREMISSES.
- Its DIVISION: it is
  - either 'A PRIORI': and then
    - either WHEREFORE or through CONVERTIBLE cause: which cause may be
      - either PROXIMATE.
      - or REMOTE.
    - or THAT or through NON-CONVERTIBLE remote cause....
  - or 'A POSTERIORI': and then
    - either UNIVOCAL.....
    - or ANALOGOUS........
  - either DIRECT.
  - or INDIRECT.

……

SECTION SEVEN.

……

THE PREPARATION OF SCIENTIFIC PROOF OR DEMONSTRATION,

OR

THE DISCOVERY OF PRINCIPLES.

……

353. ORDER OF PROCEDURE: Having dealt with the nature and division of certain proof or demonstration, we must deal now with the preparation of it.

A. This treatment will deal:

a. First, with those things which must be known before demonstration, i.e. with the fore-knowns to demonstration.

b. Secondly, with the origin of first principles.

c. Thirdly, with the discovery of scientific laws.

B. Accordingly this section will proceed in the following order:-

On the preparation for demonstration	The foreknowns to demonstration	Chapter thirty-two.
	The origin of first principles	Chapter thirty-three.
	The discovery of scientific laws	Chapter thirty-four.

……

CHAPTER THIRTY-TWO.

……

THE FOREKNOWNS TO DEMONSTRATION.

……

354. ORDER OF PROCEDURE: This treatment of those things which must be known before demonstration:

A. Will consider:
a. *First,* the necessity of knowledge of some things before demonstration.
b. *Secondly*, which things must be known before demonstration.
c. *Thirdly*, the evidence of the premisses.
d. *Fourthly*, the diverse species of principles of demonstration.

B. Hence the following order:-

On the foreknowns to demonstration	Necessity of some foreknowns	Article one.
	Which are the foreknowns	Article two.
	The evidence of the premisses	Article three.
	Diverse species of the principles	Article four.

……

ARTICLE ONE.

NECESSITY OF SOME FOREKNOWNS.

355. SOME THINGS MUST BE KNOWN BEFORE DEMONSTRATION: This is evident both from the nature of demonstration, and from the actuation of our intellect through demonstration.

A. For demonstration is effected through things more known *TO US* (quoad nos), as appears from the nature of demonstration. (Cf. n.346, B).

B. Moreover:
a. By means of demonstration, our intellect is reduced from potency (i.e. from this that it *can* know the conclusion) to act (i.e. to this that it *does* know the conclusion).
b. But no thing is reduced from potency to act save through being in act:
b1. just as water is not reduced from '*can-be-hot*' to '*does-be-hot*' save through some being (v.g. fire) which does-be-hot;
b2. which means that in the order of knowledge reduction to act is through some actual knowledge, i.e. through some *FOREKNOWN*.

356. "BEFORE DEMONSTRATION": Note that:

A. It is said that some things must be known *before demonstration*,

B. Not before any knowledge whatsoever: for then knowledge would be quite impossible; for there would be regress unto infinity, which is repugnant.

....

ARTICLE TWO.

WHICH ARE THE FOREKNOWNS.

357. CONCLUSION: As will appear from what will be here said (nn.358-359), THIS NECESSITY THAT SOME THINGS BE FOREKNOWN CONCERNS THE TRUTH OF THE PREMISSES AND KNOWLEDGE OF SUBJECT AND PREDICATE.

358. THE TRUTH OF THE PREMISSES: The truth of the premisses must be foreknown:

A. Because they are the CAUSES of the truth of the conclusion.

B. Wherefore:
a. Also of S and P must something be foreknown;
b. for otherwise the truth of the premisses would not be foreknown.

359. WHAT MUST BE FOREKNOWN OF SUBJECT AND PREDICATE: However, of concepts there is a twofold knowledge, to wit: THAT THEY ARE and WHAT THEY ARE.

A. But of the SUBJECT of the conclusion both THAT IT IS and WHAT IT IS must be foreknown.

a. THAT IT IS indeed: for in every demonstration P is said to be-in S. Which supposes that it be foreknown about S that it is; for otherwise nothing could be affirmed about it. But this is to be taken DIVERSELY:

a1. In RATIONAL science:
a1a. whose S abstracts from space and time,
a1b. it suffices that about S it be foreknown that it is in OBJECTIVE be (i.e. that it is in the order of possible and knowable essences).

a2. But in POSITIVE science:
a2a. whose S depends upon time and space,
a2b. it is necessary that about S it be foreknown that it is in the ACTUAL be of nature, i.e. that it exercise be in time and space.

b. And also WHAT IT IS: but DIVERSELY:

b1. In 'a priori' demonstration it is necessary that about S be foreknown the 'what of the thing' or its real definition. (Cf. nn.167-168). For this demonstration is made by the medium of an M:
b1a. which is either the DEFINITION of S,
b1b. or its PROPERTY: which is manifested by its real definition.

b2. But in 'a posteriori' demonstration, which is through effects:
b2a. it suffices that about S be foreknown the 'what of the name' or its nominal definition (cf. nn.167-168),
b2b. since in this demonstration M:
b2b1. is not the essence or property of S,
b2b2. but is its EFFECT: as is clear from the following example (in Ferison):

'MOVEMENT does not exist without an unmoved-moving-thing.
But MOVEMENT exists in the world.
Therefore something that exists in the world does not exist without an unmoved-moving-thing'.

B. But of the PREDICATE of the conclusion only WHAT IT IS must be foreknown.

a. Not indeed that it is, i.e. that it is-in S: for this is what is to be demonstrated.

b. Yet indeed WHAT IT IS:

b1. Not however its real definition, because this definition depends on the question 'whether it is' (that it is).
b1a. For P is a property (at least in a broad sense) of S.
b1b. But into the real definition of a property, enters its proper subject: (thus into the real definition of will enters its proper subject, viz. intellect).
b1c. Therefore the real definition of P supposes answered the question 'whether it is': which, as said above, is not answered before the demonstration but only by means of the demonstration.

b2. Therefore the nominal definition of P suffices.
b2a. Yet this is necessary:
b2b. for otherwise nothing would be known about P: which is repugnant. (Cf. In Prior. Anal. lect. 2).

360. THEREFORE NO SCIENCE DEMONSTRATES ITS OWN OBJECT: From what has been said follows the meaning of the saying: "No science proves or demonstrates its own object, but supposes it." Along with CAJETAN we must distinguish:

A. "Whether every SCIENCE, metaphysics as well as geometry SUPPOSES ITS OWN PROPER SUBJECT TO BE, and whether it connot be proved that it is?"
a. Then "the answer is.........that it cannot be proved, neither 'a priori' nor 'a posteriori'."
b. For about it, it must be foreknown that it is in objective be (n. 359, A.a).

B. "Whether every DEMONSTRATION supposes the proper subject of that demonstration to be? Then "answer is made in two ways:
a. "In the first ([illegible]) that every demonstration" supposes "its subject to be" either in objective beor in real be.
b. "But in another way, and............better........that not every demonstration supposes its subject to be:
b1. "since sometimes it seeks it and demonstrates it,
b2. "and this I hold universally in all demonstrations terminating the question 'whether it be'." (In II Post. Anal. c.1, ad 8 dub.).

....

ARTICLE THREE.

THE EVIDENCE OF THE PREMISSES.

361. CONCLUSION: As will appear from the considerations exposed hereunder (nn. 362-364), THE PREMISSES OF EVERY SCIENTIFIC DEMONSTRATION MUST BE SELF-EVIDENT (PER SE NOTAE) AND INDEMONSTRABLE, OR, IF THEY ARE NOT SELF-EVIDENT AND INDEMONSTRABLE, THEY MUST BE DEMONSTRATED BY RESOLUTION TO AN INDEMONSTRABLE SELF-EVIDENT PRINCIPLE.

362. PREMISSES CANNOT BE DEMONSTRATED UNTO INFINITY:

363. DEMONSTRATION MUST BEGIN FROM SELF-EVIDENT PREMISSES: Therefore demonstration must begin from certain SELF-EVIDENT premisses: which, being self-evident, neither need to, nor can, be demonstrated.

364. DEMONSTRATION MUST REACH SELF-EVIDENT PRINCIPLES: But if the premisses ARE NOT SELF-EVIDENT (i.e. not known through themselves):

A. Then they need demonstration.

B. Which demonstration must be carried back until some self-evident principle is reached:
a. for otherwise there would be similarly regress unto infinity,
b. whereby would be destroyed the certitude of the demonstrated conclusion.

……

ARTICLE FOUR.

DIVERSE SPECIES OF PRINCIPLES OF DEMONSTRATION.

365. EXISTENCE OF SELF-EVIDENT PRINCIPLES SUPPOSED HERE: That there are self-evident principles (principia per se nota), is supposed here, just as it is also supposed that science exists.

A. This question of whether there be any self-evident principles is dealt with in defensive metaphysics.

B. Where the existence and value of self-evident principles is defended:
a. especially against modern Nominalists, such as Goblot and others,
b. who:
b1. by reason of this nominalism, denying the certitude of these principles (cf. Goblot: Traite de Logique, pp.327-328),
b2. admit them only as hypotheses, because of their utility and practical necessity for thought.

366. DIVERSE SELF-EVIDENT PRINCIPLES: But here it is necessary to distinguish diverse self-evident principles, to wit:

A. AXIOMS (also called 'dignitates') or FIRST PRINCIPLES OF REASON:
a. such as:
a1. the principle of identity or of contradiction,
a2. the principle of causality,
a3. the principle of finality, etc....;
b. which are:
b1. common to all beings,
b2. self-evident to all, even to the unlearned or unwise,
b3. and naturally known.

B. COMMON PRINCIPLES, self-evident, not to all, but TO THE WISE OR LEARNED ONLY.
a. Such are PHILOSOPHIC principles,
b. as, for example, this: 'those things which are circumscriptively in place are bodies'.

C. PRINCIPLES PROPER TO THE SCIENCES, or SCIENTIFIC LAWS, which are SELF-EVIDENT TO SCIENTISTS ONLY.
a. These are not demonstrated,
b. but, as will be explained bélow, are obtained, in the sciences of nature, by INDUCTION.

……

SCHEMATIC SUMMARY.

367. SCHEMATIC RECAPITULATION: The contents of the fore-going chapter may be thus schematically summarized:-

On the foreknowns to demonstration

- WHETHER THEY BE
  - They are not before all knowledge.
  - But before all demonstration.
- WHAT THEY ARE:
  - Concerning concepts:
    - Concerning S.
      - That it is
        - in OBJECTIVE be: in rational science.
        - in ACTUAL be: in positive sciences.
      - What it is
        - OF THE THING: in 'a priori' demonstration.
        - OF THE NAME: in 'a posteriori' demonstration.
    - Concerning P.
      - Not that it is: because this is to be demonstrated.
      - But what it is
        - Not OF THE THING: because this depends on the question 'whether it be'.
        - But OF THE NAME.
  - Concerning premisses:
    - Either they are self-evident.
    - Or they are demonstrated by resolution to a self-evident principle.

……………………………………………

CHAPTER THIRTY-THREE.

……………………

ORIGIN OF THE FIRST PRINCIPLES OF REASON AND OF PHILOSOPHY.

……………………………………………………………

368. ORDER OF PROCEDURE: This treatment of the origin of the first principles:

A. will consider:
a. First, the origin of the first principles of reason or dignities.
b. Second, the origin of the common principles of philosophy.

B. Hence the following order:-

On the origin
- of the first principles of reason or dignities...........Article one.
- of the common principles of philosophy...................Article two.

....

ARTICLE ONE.

ORIGIN OF THE FIRST PRINCIPLES OF REASON, OR DIGNITIES.

369. DOCTRINE OF KANT AND IDEALISTS: Kant, and idealists generally, teach that:

A. These principles are acquired simply 'a priori', from the mere activity of the intellect.

B. Which opinion logically follows from their theory that in knowledge the knower has itself purely actively.

370. DOCTRINE OF POSITIVISTS AND MODERN NOMINALISTS: On the other hand, positivists and modern nominalists generally:

A. Regard the first principles of reason:
a. as useful or convenient conventions,
b. but lacking true certitude.

B. Thus Goblot writes:
a. "There is an infinity of possible geometries, among which the ordinary geometry is the simplest, and for so much, the most commodious. Nothing authorizes us to think that it is the only true one and that the others are false.

b. "It is assuredly the same with all the indemonstrable principles. One may suppose them false, since there is no reason to judge that they are true. They present themselves therefore under the form of alternatives. But of the hypotheses the one is simpler and more convenient than the other.

c. "To choose this hypothesis, is not to affirm it; it is not question of an act of faith, of a belief justified, in default of theoretical reasons, by its practical utility. Rationally, it is neither possible nor necessary to hold as true the indemonstrable principles. It is legitimate to draw the consequences from them, and what is true is that these consequences do result from them........

d. "..........The principle of contradiction itself is an indemonstrable. If any axiom seems evident through itself, it is this one. But it is natural that it should appear evident, for, as it is the condition of the possibility of every judgment, as soon as one thinks, one has already taken it as a principle. Nevertheless metaphysicians have shown that we are not constrained to posit it save as a law of thought, and that we do not know if it is also a law of things; some, more daring, have examined the hypothesis that contradiction would on the contrary be the law of being, of the thing in itself. The principle of contradiction also would therefore be a postulate. One could not suppose it false, because then there would no longer be any difference between the true and the false, so that one could no longer think, not even to judge that it is false. But one can understand that the interest of our thought is the sole reason that we have for taking it as a rule. Like all the postulates, it presents itself as an alternative: it is question of taking the more convenient side. But here convenience becomes an imperative necessity, not logical, but practical, and the contrary side an absolute impossibility, not logical, but practical. To reject the principle of contradiction would be to renounce thinking.

e. "The indemonstrables are not truths. They are hypotheses which we have no reasons to hold as true, but have motives to take as rules. They are not logically necessary, but they are necessary to us. Thought must accept the conditions of its own exercise. To make use of our reason, we are obliged to conduct ourselves as if we were convinced of the rationality of the universe. Science, in its totality, and, with it, all knowledge in general, is affected by relativity. In its ensemble, science is a vast hypothesis, an option, a risk boldly run, an audacity unconsidered at the beginning, but amply justified after the event by success and the legitimate hopes which it engenders." (Goblot: Traite de Logique, ed. 1920, pp.327-328, Cf. Rougier: Les Paralogismes du Rationalisme).

371. THE FIRST PRINCIPLES ARE KNOWN BY ABSTRACTION FROM SENSIBLES: Against all the above mentioned (nn.369-370), it must be said that:

A. The first principles of reason, or dignities, and NEITHER purely 'a priori', NOR conventions, but are IMMEDIATELY known upon their terms being known by abstraction from sensibles.

a. For self-evident or 'per se' known is a proposition:
a1. whose predicate is included in the notion of the subject,
a2. and whose predicate, upon the terms being known, is thereby known to be-in the subject.

b. For the rest, the dignities are propositions whose terms are common things, which no one is ignorant of, such as 'being' and 'non-being', 'whole' and 'part' and the like (I, q.2, a.1).

B. But these terms:
a. Are not constructed by the mind alone, as if the mind were, in knowing, purely active, as IDEALISTS contend.
b. Nor are they received by experience alone, as if the mind were, in knowing, purely passive, as POSITIVISTS and EMPIRICISTS contend.
c. But they are known by abstraction from sensibles whereby the mind actively receives its knowledge from sensible experience.

372. NOT BY INDUCTION ARE THE DIGNITIES ACQUIRED: Nor is it satisfactory to say, as some do (v.g. Boyer: Cursus Philosophiae, vol. I, pp.246-254; Hoenen: De origine primorum principiorum scientiae, in Gregorianum, 1933, pp.153-184), that the dignities are acquired BY INDUCTION, even if this induction be pronounced natural and rapid.

A. For it is required for induction that the mind does not ascend to a universal principle, unless it has previously affirmed the agreement of P and S IN SOME PARTICULAR CASE.
a. But this is not verified in the case of the dignities. For the human mind knows the universal before the singular.
b. Wherefore it immediately apprehends the universal P and S, which being apprehended, it immediately knows the agreement of the universal P and S, as said above.

B. AND IF IT BE OBJECTED:

a. First:

a1. That this agreement is not known save upon knowledge of the real definition of S and P, which is not immediately known.

a2. For the answer is:
a2a. That in the case of the dignities, whereof it is question here, S and P, are not, as St Thomas says, unknown to anyone.
a2b. Moreover, as has been said above (n.175), real definition is obtained:
a2b1. not by induction,
a2b2. but BY ABSTRACTION.

b. Secondly:

b1. That St Thomas says that "UNIVERSALS, from which demonstration proceeds, do not become known to us, SAVE THROUGH INDUCTION". (In I Post. Anal. lect.30).

b2. For the answer is that over and over again St Thomas uses the name 'induction' to signify the abstraction of universal CONCEPTS from a particular: which is another acceptation of the name 'induction' than when it is taken as 'inductive argumentation': for this latter is concerned about propositions.

b2a. In the text cited, St Thomas is using the name 'induction' in the sense of 'abstraction of universal concepts': since in this text it is question of universals.

b2b. Moreover St Thomas expressly affirms this in the same passage: "The principles of abstract (things), from which demonstrations in these things proceed, are not manifested to us, save from some particulars, which we perceive by sense. For instance, from this that we see some sensible singular whole, we are led to know what is a whole and a part, and we know that every whole is greater than its own part, by considering this in many." (In I Post. Anal., lect. 30).

C. "What is said here by St Thomas", write the commentators of this text in the Leonine edition (p.259, nota d), "is not to be passed by without philosophical consideration.

a. "For two genera of universals are said by the Angelic Doctor to be got by our intellect by means of induction;

a1. "Of which the first are universal elements, but dividedly and, so to speak, disassociated from each other: 'from this, that we see some sensible singular whole, we are led to know what is a whole and a part'. (Cf. Con.Gent. II, c.88).

a2. "The others are the same elements compared and composed into a judgment: 'and we know that every whole is greater than its own part'.

b. "Beyond doubt from analysis of whole is seized its predicate, viz, greater than its own part; but FROM THIS VERY JUDGMENT, does St Thomas mean to say, THE INDUCTION IS NOT EXTRANEOUS.

b1. "For he explicitly teaches that so far do we understand that the concept of whole carries with itself something greater than any part of it, because we have considered this in many.

b2. "Therefore just as to our intellect incomplex universals are not manifested save from individual sensibles; so the principles of abstract (things) from which demonstrations in these things proceed, are not manifested to us save from some particulars, which we perceive by sense, as St Thomas asserts immediately before.

c. "BUT ONE MUST PROCEED WITH CAUTION IN THIS MATTER, and the doctrine of St Thomas must be rightly understood. Nor from any other than the holy Doctor himself is the explication of his mind to be taken.

c1. "In the Commentaries on IV Metaphysic., lect.VI, speaking of the knowledge of the first principles, he teaches that the only subjective efficient cause of that knowledge is our intellect, but the objective cause is THE PERCEIVED KNOWNNESS OF THE TERMS, from which those principles are composed: 'for from the very natural light of the poietic intellect, the first principles become known; nor are they acquired through reasonings, but ONLY THROUGH THIS, THAT THEIR TERMS BECOME KNOWN'.

c2. "But from which source do their terms become known? By the aid of the senses. 'Which indeed is effected through this, that from sensibles is got a memory and from the memory 'experimentum', and from the 'experimentum', knowledge OF THOSE TERMS.' The senses therefore are not properly the cause, but rather are the matter of a cause (and therefore they are necessary), namely, they furnish a sensible, from which the intellect, as the true efficient cause 'per se' of ideas, gets knowledge of those terms. 'Which being known, are known such common propositions which are the principles of the arts and the sciences'. They are known from the sole force of the terms and by the mind solely, but not without a determining motive got from the senses.

c3. "Therefore the mind solely is the cause of the knowledge of the principles, just as the mind solely culls through sense, memory and 'experimentum' the universal elements (terms) in singulars, (universal elements) from which it composes the principles by the medium of judgment.

c4. "When therefore St Thomas says in this 'lectio': 'we know that every whole is greater than its own part, by considering this in many', understand his assertion according to the explanation given by the holy Doctor himself, viz. 'by considering this in many', that is, by getting from experience knowledge of the terms WHOLE and PART, and IN THEM knowing the relation between one and the other.

c5. "BUT YOU WILL SAY:

c5a. "The terms of certain principles can be had at once, although not without sense and memory, yet without 'experimentum', as are the terms of transcendent principles: 'it is impossible that the same together be and be not', and other such.

c5b. "I answer that it does not affect our question, whether as regards the terms of some principles our mind know, without 'experimentum' in many or in a few, in one singular: for 'experimentum' is a third requisite, where sense and memory do not suffice to the intellect for knowledge of the terms through one sensible. Wherefore the same St Thomas, speaking of the first concepts of the intellect, says that 'at once by the light of the poietic intellect, they are known, through species abstracted from sensibles, whether they be complex, as the dignities, or incomplex, as the notion of being, and of one, and such like, which the intellect apprehends at once ' (De Verit. XI. De Magistro, art. 1)."

c6. For the understanding of the above, NOTE that:

c6a. "'EXPERIMENTUM' seems nothing else than to take something from many retained in memory." (In II Post. Anal. lect.20).

c6b. St Thomas employs the name 'experimentum' to translate the Greek 'empeiria'.

D. This teaching of St Thomas about the origin of the first principles of reason is based on his doctrine of intellective knowledge apprehending THE UNIVERSAL BEFORE THE SINGULAR.

a. But if there be anyone who holds, along with SCOTUS or SUAREZ, that the human intellect directly apprehends the singular:

b. such a one must attribute the origin of the first principles to induction properly so-called. For:

b1. the singular terms being apprehended,

b2. the intellect immediately makes a singular judgment,

b3. from which it rises to a universal judgment BY GENUINE INDUCTION.

……

ARTICLE TWO.

ORIGIN OF THE COMMON PRINCIPLES OF PHILOSOPHY.

373. THESE PRINCIPLES ARE KNOWN BY ABSTRACTION FROM SENSIBLES: These principles are concerned about the nature or properties of things.

A. They also are self-evident (per se nota).

B. Therefore:

a. They are known, like the first principles of reason, immediately, upon the terms being by means of abstraction, albeit a more difficult abstraction, known.

b. For whenever P of a proposition is the nature or a property of S, then:

b1. the nature of S and P being known,

b2. P is known to be-in S.

……

SCHEMATIC SUMMARY.

374. SCHEMATIC RECAPITULATION: The doctrine of the foregoing chapter may be thus schematically summarized:-

- The first principles of reason
  - are
    - Neither PURELY A PRIORI, as say
      - SUBJECTIVISTS.
      - and IDEALISTS.
    - Nor commodious conventions, as say POSITIVISTS.
  - But are known immediately
    - NOT by induction.
    - BUT by abstraction from sensibles.

……

CHAPTER THIRTY-FOUR.

THE DISCOVERY OF SCIENTIFIC LAWS.

375. ORDER OF PROCEDURE: This treatment of the discovery of scientific laws:

A. Will consider:
a. First, their origin.
b. Secondly, their value as principles of scientific proof.

B. Hence the following order:-

- **On the discovery of scientific laws**
  - Their origin............................Article one.
  - Their value as principles of proof.......Article two.

……

ARTICLE ONE.

ORIGIN OF SCIENTIFIC LAWS.

376. CONCLUSION: As will appear from the considerations exposed here-under (nn.377-379):

A. UNIVERSAL SCIENTIFIC LAWS, WHICH ARE CONCERNED WITH EMPIRIOLOGICAL PROPERTIES OR WITH PHENOMENA, CAN BE DISCOVERED ONLY BY INDUCTION.

B. This assertion, as it sounds, excludes mathematical laws:
a. which are concerned about the properties of mathematical essences,
b. and therefore are obtained:
b1. either by simple analysis of these essences,
b2. or by deduction.

377. SCIENTIFIC LAWS ARE NOT OBTAINED BY ANALYSIS: Scientific laws, of which it is question here, cannot be obtained by ANALYSIS of S and P.

A. For these laws:

a. since they are concerned only with the external, empiriological signs of philosophical properties,

b. cannot be discovered from analysis of the terms.

B. For only judgments,

a. whose:

a1. P is:

a1a. either of the essence,

a1b. or of some philosophical property,

a2 of S,

b. can be obtained by analysis.

C. For the understanding of this, NOTE what is meant by philosophical or ontological properties on the one hand, and empiriological properties on the other.

a. Let us first consider the TWO analyses which a concept may admit, to wit, ontological analysis or analysis into being on the one hand, and empiriological analysis or analysis into observed phenomena or sensations or operations of observation or of measurement on the other hand. By way of example, "let us try a rigorous ascertainment of a word found both in philosophical and positive contexts.........To the question what does the word man mean?

a1. "The answer will be 'rational animal': now, none of the elements of this definition presents a character of irreducible clarity. Take one of them, for instance, animal. What does this word mean? A correct definition would be: 'a living body endowed with sense knowledge', and these are so many terms which badly need clarification. Take one of them, for instance, 'living'. I would say that a body is a living one when it moves itself, when it is the active origin of its own development. If we go any step further, we go beyond the limits of physical thought. In order to render the idea of life clearer, we would have to define it as self-actuation. The concept of self-actuation does not imply any reference to the proper principles of corruptible and observable things: it is a metaphysical concept. Its elements are identity and causality. Identity is the first property of being. Causality can be analysed into potency and act. Identity, potency and act are so many concepts directly reducible to that of being, which is, in an absolute sense, the first and most intelligible of all concepts. We have reached the ultimate term of the analysis, the notion which neither needs to be nor can be defined and which does not admit of any beyond. - This is the kind of analysis that the word man suggests when it is used in certain contexts. Everybody would agree that a discourse which demands such an analysis is a philosophical one.

a2. "But the same word man is often used in contexts which neither demand nor could stand such an analysis. I happen to find the word man in a treatise on zoology: explaining it in the way we did just now would seem perfectly ridiculous. An analysis whose term is the concept of being has obviously nothing to do with the behaviour, the method, the spirit and the principles of the whole discipline we call zoology. Should a univocally-minded philosopher try to enlighten a zoologist by giving him explanations about self-actuation as a particular form of relationship between potency and act, no doubt the zoologist would burst into laughter and declare that all these stories are perfectly nonsensical for him as a scientist. - The zoologist would be right and the philosopher would be univocally-minded. Both philosopher and zoologist consider man, but they have a different way of defining objects and of answering the question what does it mean? For the zoologist, man is a mammal of the order of Primates. How would he define such a term as mammal? A vertebrate characterized by the presence of special glands secreting a liquid called milk. How is milk defined? In terms of colour, taste, average density, biological function, chemical components, etc. - Here the ultimate and undefinable element is some sense datum; it is the object of an intuition for which no logical construction can be substituted and upon which all the logical constructions of the science finally rest. In some cases, the explanation of a positive definition quickly demands recourse to sense experience. This often happens in the least elaborated parts of science. The elaboration of scientific concepts generally postpones the time when the recourse to sense intuition appears indispensable. But sooner or later it always imposes itself unmistakably. It is the possibility of being ascertained through sense experience which gives the concept its positive meaning. Every concept is meaningless for the positive scientist which cannot be, either directly or indirectly, explained in terms of sensations" (The Maritain Volume of The Thomist, pp.90-91).

b. And similarly:

b1. If a mineralogist is asked 'WHAT IS SILVER', he will answer by some such definition as this: 'A metal which is sonorous, ductile, very malleable, highly polishable, having a higher thermic and electric conductivity than any other metal known, melting when heated to 960.5 degrees centigrade, boiling when heated to 2,000 degrees centigrade.'

b1a. But if he is asked regarding any one of the elements in this definition: 'WHAT IS IT', then his answer will be a definition of similar sort.

b1b. And ultimately he will be driven back to certain indefinable elements, which will be OBSERVED PHENOMENA or SENSATIONS or OPERATIONS OF OBSERVATION or OF MEASUREMENT.

b1c. Therefore his concept of silver is ultimately made up from, and is ultimately analyzed into, SUCH EXTERNAL AND OBSERVABLE SIGNS of silver. But THAT WHICH SILVER IS (i.e. the essence of silver) remains undisclosed to him IN ITSELF, being disclosed and known only in its external and observable signs. He knows indeed what silver is (the essence of silver), for he knows that it is 'that hidden or mysterious something (undisclosed in itself) which exhibits those observable or measureable phenomena'.

b1d. These OBSERVABLE SIGNS of an essence, not manifesting what the essence is in itself, but indicating the essence as their own ultimate explicative, without however manifesting how it explains them, and leaving the essence unknown and undisclosed in itself, are called its EMPIRIOLOGICAL PROPERITES.

b1e. They are not philosophical properties, because they are NOT EXPLAINED TO US by the essence, (since we do not know how the essence is their reason of be); in other words, because it is not manifest to us, since we do not know the essence in itself, why, or how, the essence exacts them.

b2. But if we knew, not merely in such signs, but IN ITSELF, what silver is, so that the essence of silver would IN ITSELF be disclosed to us, and no longer hidden; or, in other words, if we knew the essential predicates of silver, and so could give an essential definition of it; or, again, in other words, if we understood silver in a concept manifesting the specific essence of silver THROUGH ANALYSIS INTO BEING, (so that the ultimate indefinables to which our concept would be resolved would be being, and not observed phenomena or sensations): then:

b2a. from that essence of silver thus understood we would be able to know the properties which that essence exacts; for they would be explained by the essence, since we would know how the essence is their reason of be and therefore why it exacts them.

b2b. These properties, KNOWABLE FROM THE ESSENCE and EXPLAINED BY THE ESSENCE, are the PHILOSOPHICAL PROPERTIES.

c. Therefore:

c1. whereas the EMPIRIOLOGICAL properties have themselves TO US as mere pointers to, or indicators of, or signs of, the essence, leaving this unknown IN ITSELF, and therefore leaving THEMSELVES unexplained TO US;

c2. PHILOSOPHICAL properties, on the contrary, have themselves as sequent to the essence, which, when known IN ITSELF, explains THEM.

d. Wherefore:

d1. PHILOSOPHICAL PROPERTIES can be defined: SEQUENTS ONTOLOGICALLY TAKEN TO AN ESSENCE KNOWN ONTOLOGICALLY OR IN ITSELF.

d2. EMPIRIOLOGICAL PROPERTIES can be defined: EMPIRIOLOGICAL SIGNS OF AN ESSENCE.

378. NOR BY DEDUCTION, IF THEY ARE MORE UNIVERSAL: Nor can these scientific laws be obtained by means of deduction:

A. At least if it is question:
a. of the more universal laws of the sciences,
b. and not of particular laws.

B. For particular laws:
a. can evidently be obtained from the more universal laws, by means of deduction.
b. For example:
b1. from the laws of gravitation, of friction, and of explosive force,
b2. can be DEDUCED:
b3. the law of the trajectory of some mass projected by some explosive, given such a friction or aerial resistance.

379. BUT BY MEANS OF INDUCTION: These universal laws are discovered by means of induction.

A. This indeed is already clear from a sufficient division of possible origins: for analysis and deduction have already been excluded.

B. However it can be proved directly:
a. For, in the more universal laws of the sciences, which are concerned with empiriological properties or with phenomena, by experience alone can P be known to agree with S.
b. But:
b1. universal judgments whose agreement of S and P can be known by experience alone, can be formed only by induction.
b2. For induction is nothing else than discovery, by means of experience, of the agreement of S and P of some universal proposition.

……………………………………………

ARTICLE TWO.

VALUE OF LAWS, DISCOVERED BY INDUCTION, AS PRINCIPLES OF PROOF.

380. CONCLUSION: As will appear from the considerations exposed here-under (nn.381-382):

A. THE LAWS, DISCOVERED BY MEANS OF INDUCTION, OF THEIR NATURE (PER SE) ARE NOT DEVOID OF OBJECTIVE CERTITUDE, AND THEREFORE THEY CAN BE ASSUMED AS PRINCIPLES OF SCIENTIFIC PROOF.

B. This question is of the greatest moment:

a. Both:
a1. because of the great number who DENY the objective certitude of these laws;
a2. and because of the ROLE played by these laws in the sciences.

b. For the rest,
b1. it is to be admitted, as will be explained later where we shall treat of the physical sciences, that by reason of its MATTER (that is, of the observation and experimentation of facts), the conclusions of induction SOMETIMES DO NOT ENJOY objective certitude.
b2. Nevertheless it is to be proved:
b2a. that this occurs only 'per accidens' (owing to an accidental reason),
b2b. but that 'per se' (of their nature) the conclusions of induction enjoy TRUE CERTITUDE.

381. OPINIONS DENYING THE OBJECTIVE CERTITUDE OF INDUCTION: But that any objective certitude is to be attributed to induction is denied by:

A. EMPIRICISTS and generally all NOMINALISTS, who accredit to induction only the value of probability:

a. Logically indeed do they adopt this attitude:
a1. since, by virtue of their nominalism, they reduce law to a mere summation of facts;

a2. wherefore, if the law is extended beyond the cases observed, it can enjoy only probability.

b. This probability:
b1. can indeed be very high,
b2. according as it is based on an invincible persuasion, arising from association, that the future will be like the past.

c. Thus:
c1. HUME:
c1a. says that, after we have often seen the same connections between things (v.g. between the eating of bread and nourishment of the body, or between the touching of a candle-flame and the feeling of pain), we think that the same connections will be had in the future, or that the future will resemble the past:
c1a1. not because we have any objective reason so to think,
c1a2. but because through custom we can no longer think otherwise.
c1b. And he applies this teaching of his to the principle of causality. (Cf. Enquiry Concerning Human Understanding, Sect. IV, p.II; et praesertim Treatise on Human Nature, B.I, p.III, s.V-VIII, where Hume clearly denies that principles and laws are affirmed on account of any reason intellectually perceived, but says that they are formed by force of association arising from custom).
c2. JOHN STUART MILL speaks not very differently:
c2a. For he says that when we experience some fact in which two are connected (v.g. when we experience that by a flame the finger is burnt):
c2a1. a mental association between these two is formed in us, which association becomes more and more solid by repetition of the experience,
c2a2. with the result that:
c2a2a. the sight or thought of fire suggests to us the effect (burning),
c2a2b. and we come to the general persuasion: 'flame burns the finger'.
c2b. But this general or universal proposition is nothing else than a recapitulation and summation of our past experience, with an expectation, based upon that mental association, of the same connection between these two in the future. (Cf. System of Logic: B.II, cc.5-7).

B. Many CONTEMPORARY THEORISTS OF THE SCIENCES, imbued with nominalism:
a. teach that induction:
a1. NEVER PROVES a universal conclusion,
a2. but only POINTS TO it or INDICATES or SUGGESTS it.
b. Wherefore scientific laws, acquired by induction;
b1. never enjoy certitude,
b2. but only some degree of probability.
c. For which reason they assign a very great role in science to the CALCULUS OF PROBABILITIES, which is a mathematical act whereby is calculated the degree of probability which a scientific law or universal conclusion of induction enjoys of being fulfilled in any determinate case or in all cases.
d. Which position they adopt, because, on account of their nominalism;
d1. they regard induction as an argumentation of the same nature as the syllogism, considering it to be a "syllogism in reverse"; (cf. n.302);
d2. wherefrom they logically conclude that scientific or incomplete induction does not prove a universal conclusion (cf. n.307).

C. IDEALISTS and SUBJECTIVISTS, who, following KANT, although they admit that induction enjoys absolute value to us or subjectively, utterly deny to it all ontological value:

a. For, according to them, the value of induction is based upon SYNTHETIC 'A PRIORI' principles innate to the mind:
a1. according to KANT, on the principle of efficient causality alone,
a2. to which LACHELIER adds the principle of final causality. (Du fondement de l'induction).

b. Some recent IDEALISTS, such as GENTILE (teoria generale dello Spirito come Atto puro, c.6, 8), and BRUNSCHICQ, teach that the principles and laws:
b1. arise FROM THE ABSOLUTE LIBERTY OF MIND,
b2. and are devoid of true necessity and certitude.

382. THE POSSIBILITY OF ACQUIRING CERTITUDE BY MEANS OF INDUCTION: Against those who deny that any objective certitude is to be attributed to induction (n.381), the possibility of acquiring certitude by means of induction IS TO BE AFFIRMED.

A. This possibility is based, ON THE PART OF THE SUBJECT, in the nature of our intellect:

a. For our intellect:

a1. (even if, in the positive sciences, it knows ESSENCES only in external, empiriological signs, - as, for example, it knows the essence 'silver', not in itself, but only in the external, observable or measureable signs 'sonorous', 'ductile', 'very malleable', 'highly polishable', 'highly conductive of heat', 'highly conductive of electricity', 'melting at 960.5 degrees centigrade', 'boiling at 2,000 degrees centigrade' etc -),

a2. is necessarily concerned with ESSENCES, i.e. necessarily understands ESSENCES (just as sight necessarily sees colours),

b. in virtue of which necessary concern about ESSENCES, it is capable of passing over from subjective parts to the universal, as it passes in the following example of induction from knowing that the predicate 'melts at 960.5 degrees centigrade' agrees with 'this piece of silver' and 'this piece of silver' and 'this piece of silver' and 'this piece of silver' and 'this piece of silver' to knowing that the predicate 'melts at 960.5 degrees centigrade' agrees with 'silver':

'a1
a2
a3 ....melts at 960.5 degrees centigrade.
a4
a5

But the universal which relatively to 'melting at 960.5 degrees centigrade' has as its subjective parts:
a1
a2
a3 ....is silver.
a4
a5

Therefore silver..........................melts at 960.5 degrees centigrade.'

B. But THE QUESTION OCCURS:

a. HOW does the mind make this passage?

b. Or: BASING THIS PASSAGE ON WHAT OBJECTIVE FOUNDATION, does the mind make it?

c. Or: WHAT LEGITIMACY has this passage?

C. These questions - all of which amount to the same - are diversely answered by authors.

a. Some, with LACHELIER;

a1. Contend that the mind, given that a constant fact has been observed:

a1a. is, in induction, passing from the major (i.e. from constancy in the observed cases) to the conclusion (i.e. to constancy in ALL cases, to wit, the universal),

a1b. by interpreting that constancy by the aid of the principles of UNIFORMITY OF NATURAL CAUSES or of FINALITY: v.g. 'the same natural cause in the same circumstances produces the same effects'; 'nature operates in one and the same way'; 'nature is determined to one'.

a2. But THIS CONTENTION IS FALSE:

a2a. For:

a2a1. The cause in question may be:

a2a1a. Either a cause 'per accidens' (i.e. a cause producing that effect owing to some circumstance or determination accidental to that cause, as when man produces French speech owing to the accidental circumstance or determination that he is educated in French);

a2a1b. Or a cause 'per se' (i.e. a cause INASMUCH AS IT IS SUCH or FROM ITS OWN NATURE producing that effect, as man produces speech).

a2a2. But:

a2a2a. If the cause happens to be a cause 'per accidens', then the conclusion that in ALL cases it will produce that effect, is an illegitimate conclusion.

a2a2b. If the cause happens to be a cause 'per se':

a2a2b1. then the conclusion is indeed true,

a2a2b2. but the argumentation:

a2a2b2a. is only materially good,

a2a2b2b. and reaches a true conclusion only 'per accidens' (i.e. by fluke).

a2a3. Therefore some further consideration (besides the consideration that 'silver 1' and 'silver 2' and 'silver 3' etc, when heated to 960.5 degrees centigrade, is a cause of liquid, and the consideration that natural causes acts uniformly; or, in other words, some other interpretation of the constancy of the fact) is required, - and is had (because the mind is certain, at least subjectively, of its conclusion, whereas it could not be certain if these considerations or this interpretation alone were had).

a2b. Moreover:

a2b1. This contention of Lachelier would reduce induction:

a2b1a. to this syllogism in the third figure (cf. n.307, A.a):

'a1 and a2 and a3 and a4 and a5 melt at 960.5 degrees centigrade.
But a1 and a2 and a3 and a4 and a5 are silver.
Therefore silver melts at 960.5 degrees centigrade.'

a2b1b. Which, since it is not legitimate unless 'a1 and a2 and a3 and a4 and a5' is a formally complete enumeration so that the predicate of the minor is 'ALL silvers', enabling the subject of the conclusion to be 'ALL silvers' (cf. n.307, B), - which is not so - needs to be completed by a hypothetic and conditional syllogism, whose major is taken from the principle of uniformity of natural causes, and whose minor is the legitimate conclusion ('SOME silvers, or silver in SOME cases, melts at 960.5 degrees centigrade') of the above syllogism, thus:

'If silver in some (sufficiently varied) cases melts at 960.5 degrees centigrade, then silver in ALL cases melts at 960.5 degrees centigrade.
But silver in some (sufficiently varied) cases melts at 960.5 degrees centigrade.
Therefore silver in ALL cases melts at 960.5 degrees centigrade.'

a2b2. But to what extent this argumentation is legitimate, it is not a syllogism, but is an induction disguised as a syllogism:

a2b2a. For to what extent this argumentation is legitimate, that conditional major is really this: 'If silver in some sufficiently varied or enumerated cases melts at 960.5 degrees, then (since 'silver in EVERY case' or 'silver' can be substituted for 'silver in SOME sufficiently varied or enumerated cases or for 'SOME sufficiently enumerated silvers'), silver in EVERY case or SILVER melts at 960.5 degrees.'

a2b2b. But:

a2b2b1. WHENEVER THIS ASCENSION BY SUBSTITUTION FROM SUBJECTIVE PARTS TO THE UNIVERSAL IS HAD, THEN INDUCTION IS HAD; or, in other words, WHENEVER A MORE UNIVERSAL ('melts at 960.5 degrees') IS PROVED OF A LESS UNIVERSAL ('silver') BY THE USE OF A STILL LESS UNIVERSAL ('some silver' or 'silver in some cases' or 'silver 1 and silver 2 and silver 3 etc'), THE PROCESS IS INDUCTIVE, not deductive or syllogistic.

a2b2b2. For in deduction or the syllogism a more universal (P) is proved by the medium of a less universal (M) of a still less universal (S), as explained above (n.272).

a2b3. But to what extent this argumentation is legitimate, some further, or other, interpretation of the constancy of the fact is required, and is made, by the mind, as said above (a2a3).

b. Hence others, such as BENTHEM, contend that the mind makes this passage from subjective parts (in the major) to the universal (in the conclusion):

b1. by inferring from the constancy of the fact (in the major) the necessity, and therefore the universality, of the fact (in the conclusion).

b2. Now:

b2a. TO SAY THIS IS EXCELLENT,

b2b. BUT MORE THAN THIS MUST BE SAID: for the necessity is not evident save by recourse to the principle of reason of be (or sufficient reason): 'of whatever is, there is a reason of be', and therefore 'of that constancy which exists, there is a reason of its existence'.

c. THEREFORE IT MUST BE SAID:

c1. That:

c1a. From the constancy of the observed facts (in the major), the mind concludes to their necessity, and accordingly their universality (in the conclusion);

c1b. but the reason of this constancy must be sought by the mind (it is found in the minor) in the very things themselves, that is, IN THE VERY NATURES (of 'a1', of 'a2', of 'a3' etc);

c1c. and thus the ultimate foundation of the certitude of induction is, ON THE PART OF THE OBJECT, the existence of NATURES, having determinate properties: which natures:

c1c1. although in scientific induction,

c1c1a. they be not known in themselves,

c1c1b. but only in external signs,

c1c2. nevertheless explain the constancy of the signs.

c2. And therefore it must be said that the mind reaches the universal (in the conclusion):

c2a. by substituting in the minor for the parts (a1, a2, a3, a4, a5) enumerated in the major the UNIVERSAL NATURE which IS IN those parts;

c2b. which substitution is possible and legitimate - given an observed constancy of the fact - because of the existence of that NATURE.

D. And thus not in one sole foundation, but in a TWOFOLD foundation,

a. to wit:

a1. one on the part of the subject,

a2. another on the part of the object,

b. is the value of scientific induction based.

E. Wherefrom it follows that scientific laws enjoy true certitude:

a. whenever diligent scientific observation, or experiment, has established the constancy of the fact.

b. But:

b1. if this proof of the constancy of the fact is lacking,

b2. then certitude also will be lacking.

....

383. SCHEMATIC SYNOPSIS: The contents of the fore-going chapter upon the discovery of scientific laws may be thus schematically summarized:-

Universal scientific laws arise
- NOT
  - Through analysis of S and P: because they are not about ontological or philosophical properties.
  - Through deduction, at least if it is question of more universal laws.
- BUT THROUGH INDUCTION
  - Nor are they
    - Probable only, as EMPIRICISTS AND NOMINALISTS contend.
    - Only subjectively certain, as SUBJECTIVISTS AND IDEALISTS contend.
  - But they are objectively
    - 'PER SE' certain, their certitude being based
      - subjectively, on the nature of our intellect
      - objectively, on the existence of NATURES.
    - 'PER ACCIDENS' however probable only, by reason of their matter.

……

SECTION EIGHT.

EFFECT OF DEMONSTRATION OR SCIENCE IN GENERAL.

384. ORDER OF PROCEDURE: The effect of demonstration or of scientific or certain proof - which effect is called SCIENCE - will be dealt with:

A. In two sections devoted to science, to wit:
a. On science in general: in the present section.
b. On sciences in special: in the ninth section.

B. But the treatise on science in general in the present section will deal:
a. First, with the nature of science.
b. Secondly, with the origin of science.
c. Thirdly, with the division of sciences: and indeed:
c1. in the first place, with the division of science into speculative and practical science.
c2. in the second place, with the specification and division of speculative sciences.
d. Fourthly, with the subalternation of the sciences.

C. Hence the following order of this section:-

On science in general
- Its nature..............................Chapter thirty-five.
- Its origin..............................Chapter thirty-six.
- Its division
  - On speculative and practical science..........Chapter thirty-seven.
  - On the specification and division of the sciences...................Chapter thirty-eight.
- The subalternation of the sciences.......Chapter thirty-nine.

....

CHAPTER THIRTY-FIVE.

....

NATURE OF SCIENCE.

....

385. ORDER OF PROCEDURE: This chapter on the nature of science:

A. Will:
a. First, show that science is the formal effect of demonstration.
b. Secondly, explain the nature of science or of this effect in general.

B. Hence the following order:-

On the nature of science:
- That it is the effect of demonstration.............Article one.
- Its nature.......................................Article two.

....

ARTICLE ONE.

THAT SCIENCE IS THE FORMAL EFFECT OF DEMONSTRATION.

386. SCIENCE IS OBTAINED BY DEMONSTRATION: That science is obtained through demonstration or certain proof, follows from the very notion of science, indicated briefly above and to be further evolved below.

A. For science is certain knowledge through causes.

B. But our mind, which begins from a most confused knowledge, can know causes of things:
a. neither in a first apprehension of things,
b. nor in immediate judgments.

C. Therefore our mind can have certain knowledge of the causes of things only through demonstration or certain proof.

387. SCIENCE IS THE FORMAL EFFECT OF DEMONSTRATION: And therefore it must be said:

A. That science is the effect of certain proof or demonstration.
B. And indeed the formal effect thereof: because it is the very conclusion of certain proof or demonstration.

....

ARTICLE TWO.

NATURE OF SCIENCE IN GENERAL.

388. CERTAIN KNOWLEDGE THROUGH CAUSES: SCIENCE, as all are aware, is CERTAIN KNOWLEDGE THROUGH CAUSES.

A. It is therefore explicative knowledge, necessarily true:
a. And therefore it is about necessary objects only:
b. Wherefore there is no science of contingent objects.

B. Nevertheless it is, even though they be contingent, about the things of the world, not indeed in their individuality (individual things are its material object), but abstract (its formal object).

a. For which reason, science is:
a1. directly and 'per se' (of its nature) about UNIVERSAL essences,
a2. indirectly only ABOUT INDIVIDUALS, from which universal essences are abstracted (individual things having themselves as a term wherefrom).

b. This cannot be understood by those:
b1. who consider the universal as a certain construction of the mind, not having ontological value save through reference to individuals (which then have themselves as a term whereunto);
b2. or who endeavour to construct a science of the individual, as does Chevalier;
b3. or who conceive all science after the manner of practical science, as does Blondel.

389. DIVERSE WAYS IN WHICH SCIENCES ATTAIN ESSENCES: But NOT IN THE SAME WAY do all sciences attain essences:

A. Some:

a. are about essences, as known, ALTHOUGH NOT EXHAUSTIVELY NOR ADEQUATELY as they are in themselves:
a1. (If our intellect knew essences adequately or exhaustively or comprehensively, then there would be as many sciences as there are essences: for each essence adequately known would be a specifically distinct medium of demonstration whereby would be demonstrated the properties of that essence: cf. John of St Thomas, Cursus Phil. t.I, pp.8.9, 824).
a2. Sciences about essences as known are PHILOSOPHY and MATHEMATICS.

b. Yet diversely are they about essences:

b1. MATHEMATICS is about accidental essences abstracted from sensible thing,
b1a. (to wit, quantity and whatever 'per se' pertains to quantity),
b1b. which are considered by the mathematician in themselves, independently of their subjects, AS IF THEY WERE SUBSTANCES.

b2. But PHILOSOPHY is about substances or substantial essences which are known IN THEIR ONTOLOGICAL PROPERTIES. (Cf. n.377, C).

c. Both philosophy and mathematics:
c1. are:
c1a. deductive science (analytico-deductive),
c1b. science WHEREFORE (propter quid: cf. n.349), i.e. explicative science ('science d'explication'),
c2. whereby the CAUSES of essences become in themselves known to us.

B. But other sciences are also about essences, but as occult or hidden or undisclosed.
a. About essences indeed, because science is an intellectual knowledge which is necessarily about essences.
b. Yet as occult: For in these sciences:

b1. essences do not become known to us save through constant, observable, external signs (or through empiriological laws established by induction),

b2. which PRACTICALLY take the place, as the medium of demonstration, of the ESSENCES OR CAUSES which remain unknown.

c. These sciences are:

c1. experimental, inductive, sciences,

c2. sciences THAT (quia: cf. n.349, C), i.e. sciences of ascertainment or of statement ('sciences de constatation).

d. These sciences,

d1. inasmuch as they are much less perfect than the others,

d2. necessarily tend towards a deductive form, which is more perfect (because the imperfect is of itself for the sake of the perfect),

d3. and by reason of that very tendency they seek to be subalternated to a deductive science:

d3a. whether to philosophy,

d3b. or to mathematics.

390. SCIENCE OBJECTIVELY AND SUBJECTIVELY CONSIDERED: But because every science has an object wherefrom it is specified, science can be considered in two ways, to wit:

A. OBJECTIVELY: inasmuch as it is a complex or ordered multitude (a system) of scientific knowledges about some object:

a. Thus taken science is a logical artefact or construct, consisting in an ordering of concepts whereby definitions, divisions and argumentations are constituted: it exists:

a1. permanently in the mind as an ordering of species (types);

a2. and in writing (books) as in its sign.

b. It is under this acceptation that the moderns always consider science.

B. SUBJECTIVELY: inasmuch as science is considered in the scientist:

a. Under this aspect science is a habit perfecting the intellect in relation to some scientific object (object of science).

b. This acceptation:

b1. though unknown to the moderns,

b2. is nevertheless THE MORE PRINCIPAL;

c. And the acquisition of this habit is the end of all study.

……

SCHEMATIC SUMMARY.

391. SCHEMATIC SYNOPSIS: What has been said in the fore-going chapter on the nature of science in general, may be thus schematically summarized:-

Science
- Whether it be considered
  - either OBJECTIVELY, as it is in books.
  - or SUBJECTIVELY, as it is a HABIT, in the scientist.
- is concerned
  - DIRECTLY about UNIVERSAL essences
    - either as known: and then
      - either accidental essences considered independently of their subjects: and then the science is MATHEMATICS.
      - or substantial, known in their ontological properties: and then the science is PHILOSOPHY.
    - or as occult, and known only in their observable signs (empiriological properties and laws): and then is had POSITIVE SCIENCE.
  - INDIRECTLY about individual things, inasmuch as essences exist in individuals.

……

CHAPTER THIRTY-SIX.

ORIGIN OF SCIENCES.

392. THE THEORY OF THE 'SOCIOLOGICAL' SCHOOL: According to this theory, propounded by DURKHEIM and his followers, who are called the 'Sociological' School:

A. The origin of sciences must be found in religion:
a. from which little by little scientific notions were freed,
b. so as to acquire autonomy.

B. Earlier indeed, COMTE had sustained the same opinion in his doctrine of the three ages of the human race: according to which:

a. Primitive men explained the phenomena of nature from the influence of the gods upon things:
a1. Thus they explained, for example, lightning from the anger of the gods, and the growth of crops from the benevolence of gods beneath the earth, and the existence of fire from a gift of the gods, and the existence of man from creation by the gods, and so on.
a2. In this way the human race proceeded:
a2a. from fetishism (i.e. the worship of diverse material objects, such as a rock, or a block of metal, or a cat, in which they believed some powerful spirit to dwell, who could harm or help man),
a2b. through polytheism,
a2c. to monotheism.
a3. This period of the life of the human race Comte called the THEOLOGICAL stage.

b. As the gods were gradually more and more excluded from the explanation of nature, the more men came to explain natural phenomena through causes, immanent indeed to things, but metaphysical:
b1. Thus to the theological stage succeeded the METAPHYSICAL stage:
b2. In which explanations are made through occult and abstract causes (such as the 'immanent reason' of Heraclitus, the 'love hatred' of Empedocles, the participation in the 'ideas' of Plato, the soul, substantial and accidental 'forms', the 'forces' and 'operative powers' of Aristotle) and essences (such as the Schoolmen talked of), and abstractions which are conceived after the manner of realities.
b3. In this stage nature is explained 'a priori'.

c. At length, as science progresses, these metaphysical causes also are more and more expunged from the explanation of things:
c1. Thus arises the POSITIVE or SCIENTIFIC stage:
c2. in which:
c2a. instead of essence is introduced the concept of law;
c2b. instead of subjective and apriorist constructions is introduced the observation of facts and experiment;
c2c. instead of metaphysics is introduced modern positive science.

C. This explanation is neither conformed to REALITY nor proved by HISTORY.
a. True indeed it is that in recent times the positive sciences have made gigantic advances;
b. But it is not in the least legitimate to conclude:
b1. that these advances correspond to a transition from one stage to another:
b1a. as if metaphysics is an amelioration in human knowledge because theology is eliminated,
b1b. or as if positive sciences have advanced because metaphysics is eliminated.
b2. Nor that science issued forth from magic or theology.

393. THE BIOLOGICAL THEORY: According to this theory the sciences arise from the necessities of life.

A. This explanation is proposed by Bergson and many others.

B. This explanation obviously accords with Bergson's doctrine of intellect as a tool-making faculty.

C. Nevertheless that doctrine of the intellect cannot be admitted:
a. Since the intellect is:
a1. not only practical,
a2. but also speculative;
b. and indeed, even further, it is of itself:
b1. by priority speculative,
b2. and only by posteriority practical.

D. Furthermore, this explanation:
a. even if it were able to explain the origin of the practical sciences:
b. yet cannot explain the origin of the speculative sciences.

394. CONCLUSION: Hence it must be said that:

A. The nature of the human intellect, whose PROPER formal object is being abstracted from sensible things, explains:

a. That MANY DISCOVERIES of science have their origin from the necessities of life, since all human knowledge takes its beginning from sense.

b. That MANY CAUSES, at the beginning unknown owing to the imperfection of the human intellect and considered to be supra-natural, have later been acknowledged to be really natural.

B. But it is likewise clear:
a. by reason of the ADEQUATE object of the human intellect, which is being:
a1. AS SCIENTIFICALLY KNOWABLE (SCIBLE),
a2. not as makeable,
b. that the true origin of science is found in the very nature of our intellect, which, as Aristotle rightly said, naturally desires to 'SCIENTISE', that is, TO KNOW THROUGH CAUSES, or to know WHY or WHEREFORE.

……

CHAPTER THIRTY-SEVEN.

SPECULATIVE AND PRACTICAL SCIENCE.

395. ORDER OF PROCEDURE: This treatment of the division of science into speculative and practical science:

A. Will consider:
a. First, the division itself.
b. Secondly, the nature of practical science.

B. Hence the following order:-

On science
- Its division into speculative and practical science...Article one.
- Nature of practical science..........................Article two.

……

ARTICLE ONE.

DIVISION OF SCIENCE INTO SPECULATIVE AND PRACTICAL SCIENCE.

396. THIS DIVISION IS BY REASON OF END: Science, by reason of its end, is divided into speculative science and practical science, - which division indeed is taken not on the score of purposed end, but of natural end. For it is the act of every science, as said above, to know through causes.

Therefore the division of science into speculative science and practical science:

is not to be understood as if the act of the former only were to know, while the act of the latter were to operate (i.e. do or make).

But of each the act is to KNOW.

But the end of this 'know' has itself diversely in each.

For the end of SPECULATIVE science is KNOWING ITSELF:

So that speculative science knows for the sake of knowing;

"For the speculative (scientist) speculates (i.e. looks at) the truth, not for the sake of something else, but FOR THE SAKE OF ITSELF only" (i.e. for the sake of speculating it only), (In III de Anima, lect.15., ed. Pirotta, n.820ss), or, in other words "has for end the truth which he is considering" (In Boethium de Trinitate, q.5, a.1).

But the knowing exercised by PRACTICAL science is a knowing ordered towards operation:

For "the practical (scientist) speculates the truth FOR THE SAKE OF OPERATION" (In III de Anima. ibid),

or, in other words, "orders the considered truth towards operation as towards end." (In Boethium de Trinitate, ibid.).

397. THIS END IS THE END OF THE KNOWLEDGE OR SCIENCE: But note that the end whereof it is question here, and which specifies the two sciences:

A. Is:
a. the end of the KNOWING ITSELF or of the VERY SCIENCE ITSELF,
b. not the end of the operant or scientist.

B. For if the distinction were taken on the part of the operant, rightly would this distinction be rejected, as Baudin wishes to reject it. (Introd. Generale a la Philosophie, p.125).

C. Therefore, against Baudin, this division is to be retained as objectively based. (Cf. Yves Simon: Critique de la Connaissance pratique, ch.I).

....

ARTICLE TWO.

NATURE OF PRACTICAL SCIENCE.

398. PRACTICAL SCIENCE KNOWS: "Although it is on account of operation, nevertheless that operation is not an act of science, but an act of virtue." (In Boethium de Trinitate, ibid. ad 3); v.g. although moral philosophy is ordered towards speaking truthfully and paying debts and worshipping God etc, nevertheless speaking truthfully and paying debts and worshipping God are not acts of moral philosophy, but of the virtues of veracity and of justice and of religion.

A. The reason is that:
a. the act of practical science is some knowing (through causes),
b. whereas operation is some doing, (or making).

B. For in this:

a. for example, does moral philosophy (ethics) differ from prudence:
a1. that the act of moral philosophy is KNOWING an operation (doing),
a2. whereas the act of prudence is DIRECTING an operation.
b. and, for example, does the philosophy of art (poietics) differ from art:
b1. that the act of the philosophy of art is KNOWING an operation (making),
b2. whereas the act of art is DIRECTING an operation.

399. FORMAL OBJECT OF PRACTICAL SCIENCE: Nevertheless it is not sufficient in order that a science be practical, that it be about an operable (i.e. about an act or a product).

A. For a science may be about an operable as a material object (of science), which it considers speculatively:
a. then the formal object is speculative, and therefore this science is speculative, not practical.
b. Thus:
b1. For example, may natural philosophy consider buildings:
b1a. but considering them:
b1a1. not as makeable,
b1a2. but as sensible beings;
b1b. and then buildings:
b1b1. will be a material object:
b1b1a. both of natural philosophy, which considers them speculatively,
b1b1b. and of the philosophy of art, which considers them as makeable, or practically;
b1c. the formal object being diverse for each science.
b2. For example, "if a builder considers house:
b2a. "defining house and dividing house and considering its universal predicates.
b2b. "For this is to consider operables:
b2b1. "in a speculative manner,
b2b2. "and not according as they are operable." (I, q.14, a.16).

B. These last words of St Thomas indicate what is the formal object of practical science:
a. to wit: "operables according as they are operable".
b. For otherwise practical science would not be "FOR THE SAKE OF OPERATION" (In III de Anima, ut supra n.396 A.c).

400. DIVISION OF PRACTICAL SCIENCE INTO SPECULATIVO-PRACTICAL AND PRACTICO-PRACTICAL SCIENCE: But operables, "according as they are operable", can be considered by the practical intellect in two ways: to wit, according as they are "proximate to or remote from operation" (In Boethium de Trinitate, q.5, a.1, ad 4), i.e. proximate to being done or made, or remote from being done or made.

A. A science which considers operables, according as they are remote from operation, is said to be speculativo-practical science: such are, for example, moral philosophy, philosophy of art, theoretical medicine or the theory of architecture.

B. A science however which considers operables, according as they are proximate to operation, is called practico-practical science: such are, for example, the practical moral sciences (to wit, jurisprudence, casuistry, sociology etc), practical medicine or practical architecture.

C. It is to be observed that both speculativo-practical science and practico-practical science are about a UNIVERSAL object: for otherwise they would not be science.

D. It is to be noted accordingly, furthermore:
a. that this division of science by the differences 'speculativo-practical' and 'practico-practical' is a division of science;
b. and is not to be confused with the division of practical judgment by the differences 'speculativo-practical' and 'practico-practical': for:
b1. speculativo-practical judgments proceed from science,
b2. whereas practico-practical judgments proceed from prudence or art.
c. Hence the following division proposed schematically:-

JUDGMENT about an operable as operable may be

- either about it considered UNIVERSALLY: and then it is a SPECULATIVO-PRACTICAL JUDGMENT and is a judgment of SCIENCE: and then it is about an operable
  - either as remote from operation: and then the judgment is a SPECULATIVO-practical judgment, and proceeds from SPECULATIVO-PRACTICAL
  - or as proximate to operation: and then the judgment is a speculativo-PRACTICAL judgment, and proceeds from PRACTICO-PRACTICAL

  ....SCIENCE
- or about it considered SINGULARLY: and then it is a PRACTICO-PRACTICAL JUDGMENT: and then it is about an operable
  - either as a DOING: and then it is a judgment of, and proceeds from......................PRUDENCE.
  - or as a MAKING: and then it is a judgment of, and proceeds from......................ART.

E. Accordingly both speculativo-practical science and practico-practical science "is contained under practical (science), being ORDERED TOWARDS OPERATION". (In Boethium de Trinitate, q.5, a.1, ad 4).

F. But if:

a. The QUESTION is asked: whether these sciences:
a1. differ specifically, and so are specifically distinct habits,
a2. or are only parts of the same science?

b. The ANSWER seems to be that:

b1. They are not specifically distinct, and so are not diverse habits, IF IT IS QUESTION OF SCIENCES, such as medicine, which are of the order of POSITIVE sciences. Thus does St Thomas speak of the parts of medicine (In Boethium de Trinitate, q.5, a.1, ad 4), in which would be distinguished as parts of the same science:
b1a. its theoretical or speculative (speculativo-practical) part,
b1b. and its practical (practico-practical) part.

b2. BUT IF IT IS QUESTION OF MORAL PHILOSOPHY AND MORAL SCIENCE, it is probable that they are two habits specifically distinct, because beneath the genus of practical science, a diverse manner of defining seems to indicate specific diversity. For not in the same way do practico-practical moral science and speculativo-practical moral science (i.e. moral philosophy) define, or resolve their concepts (cf. n.377, C).

b2a. SPECULATIVO-PRACTICAL moral science (viz. moral philosophy) defines relatively to BEING (i.e. ontologically),
b2a1. just as do the speculative philosophical sciences;
b2a2. yet it is not a speculative science, because it already proceeds in a composite manner (i.e. "by the application of a form to a matter" - to wit, by the application of the principles of moral rectitude to acts - "and not by the resolution of a compound into its universal formal principles": I, q.14, a.16) and proceeds towards moving, albeit remotely, unto operation. (Wherefore here John of St Thomas and Gredt seem to speak less correctly).

b2b. But PRACTICO-PRACTICAL moral science (viz. moral science, v.g. casuistry, jurisprudence, sociology):

b2b1. because it must move proximately to operation,
b2b2. defines:
b2b2a. not relatively to being,
b2b2b. but relatively to CONCRETE NECESSITIES, (while, as is elsewhere explained, empiriological science defines relatively to observed phenomena or sensations or operations of measurement).

b2c. Therefore:
b2c1. between the two manners of proceeding, to wit:
b2c1a. that of speculativo-practical moral science (moral philosophy),
b2c1b. and that of practico-practical moral science (moral science),
b2c2. there seems to be the same distinction as between:
b2c2a. the ontological manner of defining proper to speculative philosophy,
b2c2b. and the empiriological manner of defining proper to positive science. (Cf. Maritain: Les degres du savoir, pp.880ss; Yves Simon: La critique de la connaissance morale, ch.VI-VII).

b3. BUT AS REGARDS MORAL THEOLOGY, it is to be said, on the contrary, that speculativo-practical moral theology and practico-practical moral theology are not diverse habits:
b3a. since there is less difference between these two than between dogmatic theology and moral theology:
b3b. which, as is proved in sacred theology, are the same habit, which is together:
b3b1. speculative,
b3b2. and practical.

....

SCHEMATIC SUMMARY.

401. SYNOPTIC RECAPITULATION: The contents of the fore-going chapter may be thus schematically summarized:-

Sciences are divided on the score of end into

- SPECULATIVE science: which is a certain KNOWING through causes FOR THE SAKE OF KNOWING.
- PRACTICAL science or KNOWING through causes FOR THE SAKE OF OPERATION:
  - Its NATURE
    - Its end, to wit, operation is taken
      - not as end of operant or scientist
      - but as end of the knowledge itself.
    - It is therefore about an OPERABLE (which is its material object)
      - Not according as this is considered in its universal predicates: (the science then would be speculative).
      - But according as it is operable this is its formal object.
  - Its DIVISION: an operable
    - May be considered as
      - Remote from operation: the science is then SPECULATIVO-PRACTICAL.
      - Proximate to operation: the science is then PRACTICO-PRACTICAL.
    - This division
      - Is not specific
        - If it is question of positive sciences (v.g. medicine): for then both the speculativo-practical science and the practico-practical science is about observables.
        - If it is question of sacred theology: because both speculativo-practical and practico-practical moral theology proceed under the same formal light (or formal character whereunder), to wit: virtual revelation.
      - But is specific if it is question of moral philosophy and moral science, inasmuch as
        - Moral philosophy resolves its concepts relatively to being.
        - But moral science resolves its concepts relatively to concrete (observable) necessities.

……………………………………………………

CHAPTER THIRTY-EIGHT.

SPECIFICATION AND DIVISION OF SPECULATIVE SCIENCES.

402. ORDER OF PROCEDURE: This treatment of the specification and division of the speculative sciences:

A. Will deal:

a. First, with the specification of the speculative sciences: which treatment will be twofold, to wit:

a1. In the first place, showing that these sciences are specified from their formal object;

a2. In the second place, exposing the diverse degrees of abstraction according to which are taken the diverse formal characters whereunder of these sciences.

b. Secondly, with the division of the speculative sciences: which treatment will likewise be twofold, to wit:

b1. In the first place, exposing their true division;

b2. In the second place, exposing the divisions proposed by modern authors.

B. Hence the following order:-

On the specification and division of the speculative sciences:	On their specification	From formal object	Article one.
		The diverse degrees of abstraction	Article two.
	On their division	As it is truly proposed	Article three.
		As it is proposed by moderns	Article four.

……

ARTICLE ONE.

SPECULATIVE SCIENCES ARE SPECIFIED FROM THEIR FORMAL OBJECT.

403. TWOFOLD FORMAL CHARACTER OF OBJECT: "Note that the formal character ratio formalis) of the object in science is twofold: the one of the object AS THING, the other of the object AS OBJECT; or the one as WHICH the other as WHEREUNDER.

A. "The formal character of the object, as THING, or WHICH, is THE CHARACTER OF THE OBJECTED THING WHICH PRIMARILY TERMINATES THE ACT OF THAT HABIT, and from which flow the passions of that subject, and which is the medium in a first demonstration: as:

a. "entity in metaphysics,

b. "quantity in mathematics,

c. "and mobility in natural (science).

B. "But the formal character of the object as OBJECT, or WHEREUNDER, is SUCH IMMATERIALITY, OR SUCH A MODE OF ABSTRACTING AND OF DEFINING: for example:

a. "without any matter whatsoever, in METAPHYSICS,

b. "with intelligible matter only in MATHEMATICS,

c. "and with sensible matter, yet not this, in NATURAL (SCIENCE)." (Cajetan: In I, q.1, a.3, n.III).

404. NECESSITY, QUALITY AND DISTINCTION OF THESE TWO CHARACTERS: "But the NECESSITY, QUALITY and DISTINCTION of these characters is to be taken from a distinction of two genera, in which the object of a science must be located.

A. "For:

a. "it must formally be:
a1. "such a THING,
a2. "suchwise SCIENTIFICALLY KNOWABLE (scibilis).

b. "And therefore:
b1. "it must have:
b1a. "both a formal character constituting it formally in such be-real" (i.e. in such reality),
b1b. "and a formal character constituting it formally in such be-knowable" (i.e. in such scientific knowability);
b2. "in order that it may be placed:
b2a. "both in the genus of things,
b2b. "and in the genus of scientifically knowables." (Cajetan: ibid. n.IV).

B. In order that this argument may be more easily understood, let us illustrate it by the aid of examples:

a. JUST AS, in order that something may be the object of a SENSE (v.g. of sight):

a1. It must formally be:
a1a. such a THING (to wit, a COLOURED THING),
a1b. suchwise SENSIBLE (to wit, SEEABLY SENSIBLE, i.e. VISIBLE).

a2. and therefore:
a2a. It must have:
a2a1. both a formal character (to wit, COLOUR) constituting it formally in such reality (to wit, in COLOUREDNESS),
a2a2. and a formal character (to wit, LIGHT) constituting it formally in such sensibility (to wit, in SEEABLE SENSIBILITY, i.e. in VISIBILITY);
a2b. in order that it may be placed:
a2b1. both in the genus of things into which it must be placed in order to be the object of SIGHT (to wit, in the genus 'COLOURED THING'),
a2b2. and in the genus of sensibles into which it must be placed in order to be the object of SIGHT (to wit, in the genus 'SEEABLY SENSIBLE', i.e. 'VISIBLE').

b. SO TOO, in order that something may be the object of a SCIENCE (v.g. of geometry):

b1. It must formally be:
b1a. such a THING (to wit, a SHAPED THING),
b1b. suchwise SCIENTIFICALLY KNOWABLE (to wit, GEOMETRICALLY KNOWABLE).

b2. And therefore:
b2a. It must have:
b2a1. both a formal character (to wit, SHAPE) constituting it formally in such reality (to wit, in SHAPEDNESS).
b2a2. and a formal character (to wit, GEOMETRICAL LIGHT) constituting it formally in such scientific knowability (to wit, in GEOMETRICAL KNOWABILITY);
b2b. in order that it may be placed:
b2b1. both in the genus of things into which it must be brought in order to be the object of GEOMETRY (to wit, in the genus 'SHAPED THING'),
b2b2. and in the genus of scientifically knowables into which it must be brought in order to be the object of GEOMETRY (to wit, in the genus GEOMETRICALLY KNOWABLE').

c. AND SO TOO for the object of every science.

405. DISTINCTIONS OF OBJECT: Accordingly, the thing which is the object of a science may be considered in two ways, to wit:

A. According as it is some thing in itself absolutely (i.e. as a thing, not as an object):

a. Then it is taken according to the reality or entity which it bespeaks in itself absolutely.

b. Thus taken it is the MATERIAL OBJECT of the science.

c. Wherefore the MATERIAL OBJECT is defined: WHATEVER BY THE SCIENCE IS KNOWN, TAKEN ACCORDING TO THE REALITY WHICH IT BESPEAKS IN ITSELF ABSOLUTELY.

B. According as it terminates the act of the science (i.e. as an object):

a. Then it is taken according to the formal character of the object:

b. But this formal character of the object is twofold, to wit:

b1. The formal character constituting the object SUCH A THING as is known by the science or terminates the act of the science: and then:

b1a. This formal character taken as a form is the FORMAL CHARACTER OR REASON OF THE OBJECT AS IT IS A THING or the FORMAL CHARACTER 'WHICH' is known, and is defined: THE CHARACTER OF THE OBJECTED THING WHICH PRIMARILY AND 'PER SE' (NECESSARILY) TERMINATES THE ACT OF THE SCIENCE.

b1b. But if the compound of this formal character with its subject (i.e. with the material object) is considered, then is had the FORMAL OBJECT 'WHICH' is known; and this is defined: THAT WHICH PRIMARILY AND 'PER SE' (NECESSARILY) TERMINATES AS A THING THE ACT OF THE SCIENCE.

b2. The formal character or reason constituting the object IN SUCH MANNER KNOWABLE by the science or terminative of the act of the science: and this is the FORMAL CHARACTER OR REASON OF THE OBJECT AS IT IS AN OBJECT or FORMAL CHARACTER OR REASON WHEREUNDER:

b2a. and:

b2a1. it is defined: THE FORMAL CHARACTER OR REASON WHEREUNDER THE OBJECT IS IN SUCH MANNER KNOWABLE BY THE SCIENCE;

b2a2. and it consists in SUCH IMMATERIALITY OR SUCH A MANNER OF ABSTRACTING AND OF DEFINING;

b2b. and it is called also, especially by more recent scholastic writers the FORMAL OBJECT WHEREBY OR WHEREUNDER.

C. Which distinctions:

a. May be thus exhibited schematically:-

The object of a science may be taken according to:

- either the FORMAL REASON OR CHARACTER OF THE OBJECT
  - AS IT IS THE OBJECT, i.e. AS IT IS KNOWABLE BY THE SCIENCE: and then is had the FORMAL CHARACTER OR REASON WHEREUNDER, OR FORMAL OBJECT WHEREUNDER OR WHEREBY.......
  - AS IT IS A THING: and then is had the FORMAL CHARACTER OR REASON WHICH is known........
- or its entity considered in itself absolutely: and then is had the MATERIAL OBJECT....................

From which results the FORMAL OBJECT WHICH

From which results the OBJECT simply speaking.

b. Just as the object of sight may be thus exhibited:-

Object of sight:
- FORMAL REASON OR CHARACTER OF ITS OBJECT
  - AS OBJECT: FORMAL CHARACTER OR REASON WHEREUNDER: light..........
  - AS THING: FORMAL CHARACTER OR REASON WHICH: colour........
  - FORMAL OBJECT WHICH: coloured extense........
- ITS MATERIAL OBJECT: opaque extense.
- OBJECT SIMPLY speaking: illuminated coloured extense.

c. Which is thus illustrated:
c1. from the object of the science of geometry:

Object of geometry
- FORMAL REASON OR CHARACTER OF ITS OBJECT
  - AS OBJECT: FORMAL CHARACTER OR REASON WHEREUNDER: The geometrical manner of abstractness and definition.......
  - AS THING: FORMAL CHARACTER OR REASON WHICH: Shape.
  - FORMAL OBJECT WHICH: Shaped body, or body as shaped....
- ITS MATERIAL OBJECT: Body.........
- OBJECT simply speaking: Body as shaped taken under the geometrical manner of abstracting and defining.

c2. from the object of the science of metaphysics:

Object of metaphysics
- FORMAL REASON OR CHARACTER OF ITS OBJECT
  - AS OBJECT: FORMAL CHARACTER OR REASON WHEREUNDER: The metaphysical mode of abstractness and definition..
  - AS THING: FORMAL CHARACTER OR REASON WHICH: Being
  - FORMAL OBJECT WHICH: Being forasmuch as it is being..
- ITS MATERIAL OBJECT: Being.......
- OBJECT simply speaking: Being forasmuch as it is being, taken under the metaphysical manner of abstracting and defining.

406. THE SPECIFICATIVE PRINCIPLE IS THE FORMAL REASON WHEREUNDER: But that speculative sciences are specified from the very formal reason or character WHEREUNDER, is manifest:

A. For "that division of being solely diversifies speculative habits, which infers a proper division of THE SPECULABLE AS IT IS SPECULABLE, through proper differences of the speculable itself: which are taken according to diversity of manner of ABSTRACTING FROM MATTER...........

B. "And if you add to what has been said that the differences of the SCIENTIFICALLY KNOWABLE AS SUCH are the very FORMAL REASONS OF THE SCIENTIFICALLY KNOWABLE OBJECT AS IT IS AN OBJECT:

C. "It follows of necessity:

a. "that the specific unity and diversity of the sciences is accounted through the unity and diversity OF THE FORMAL REASON OF THE OBJECTS AS THEY ARE OBJECTS:

b. "or, which is the same, of the formal reasons WHEREUNDER things are known scientifically." (Cajetan: ibid. n.V).

....

ARTICLE TWO.

THE DIVERSE DEGREES OF ABSTRACTION

407. PREAMBLES: Here:

A. It is question of the diverse degrees of abstraction according to which are taken the DIVERSE REASONS WHEREUNDER of the speculative sciences.

B. Note that abstraction is taken here:

a. not for the act of the mind abstracting,

b. but for the term of that act, which is the state of the object abstracted, (I.e. abstractedness).

C. For a good understanding of the formal reasons or characters WHEREUNDER of the sciences, which specify and diversify the sciences, it is necessary rightly to understand:

a. both the two genera of abstraction (n. 408),

b. and the diversity of the degrees of abstraction (n. 409).

408. THE TWO GENERA OF ABSTRACTION: Regarding this it is to be known that:

A. "ABSTRACTION by intellect is TWOFOLD, to wit, that whereby a FORMAL is abstracted from a material, and that whereby a UNIVERSAL WHOLE is abstracted from its subjective parts."

a. Now:

a1. "according to the first, quantity is abstracted from sensible matter;

a2, "according to the second, animal is abstracted from ox and lion."

b. But:

b1. moreover:

b1a. "the first I call FORMAL (intensive) abstraction,

b1b. "but the second I call TOTAL (extensive) abstraction;

b2. "because:

b2a. "what is abstracted by the first abstraction, is as a FORM OF that wherefrom it is abstracted; but what is abstracted by the second abstraction is as a universal WHOLE with respect to that wherefrom it is abstracted.

B. "But:

THESE TWO ABSTRACTIONS DIFFER IN FOUR WAYS:

a. "FIRST,

a1. "BECAUSE:

a1a. "In FORMAL abstraction each concept separately is had complete, to wit, the concept of that which is abstracted, and of that wherefrom it is abstracted, that is, the formal concept and the material concept: so that neither concept includes the other. a1a1. "For a line, in that which a line is, has completely its definition not including sensible matter. a1a2. "But conversely sensible matter has completely its definition not including anything of a line, in that which a line is: otherwise natural definitions would abstract from sensible matter.	a1b. "But in TOTAL abstraction, each concept separately does not remain complete, so that the one does not include the other; but one only, to wit, the concept of that which is abstracted" (does not include the other). "For when I abstract animal from man, the concept of man and the concept of animal do not prescind from each other; but only the concept of animal does not include the concept of man: for man is not understandable without animal.

a2. "The foundation of this difference is, that:

a2a. ".......The former (to wit, formal)abstraction: a2a1. "is not wrought through the consideration of something which is of the notion of that matter and through the non-consideration of something, which is of its notion: a2a2. "but rather it is wrought through the separation of those things which are of the notion of the formal from those which are of the notion of the material, as the example given shows.	a2b. "The latter (to wit, total) abstraction is wrought through the consideration of something which is of the notion of the inferior: and through remotion, that is, non-consideration of something which is of the notion of that same inferior: for animal is abstracted from man through this, that the intellect considers in man the 'animal' and not the 'rational', whereof both are of the notion of man.

b. "SECONDLY THEY DIFFER BECAUSE:

b1. "Through FORMAL abstraction arises in that which is abstracted: b1a. "actuality, b1b. "distinctness, b1c. "and intelligibility.	b2. "But in TOTAL abstraction arises in that which is abstracted: b2a. "potentiality, b2b. "confusion, b2c. "and less intelligibility.

c. "THIRDLY THEY DIFFER:

c1. "BECAUSE:

c1a. "In FORMAL abstraction, so far forth as something is more abstract, so much more known is it IN ITS NATURE.	c1b. "But in TOTAL abstraction so far forth as something is more abstract, so much more known is it TO US.

c2. "The foundation of these differences is because:	
c2a. "Formal abstraction is wrought through separation from potential materials and the like.	c2b. "But total abstraction is wrought through separation from actual specifics, and by how much something is the more abstracted from these, by so much is it the more potential, since genus by can-ness contains its inferiors: and so much the more is it less intelligible, since act according to itself is more known than potency.
d. "FOURTHLY THEY DIFFER: d1. "BECAUSE:	
d1a. "According to diverse modes of FORMAL abstraction, THE SPECULATIVE SCIENCES ARE DIVERSIFIED. d2. "On account of which, d2a. "Metaphysicals as such d2a2. "are not compared to Naturals after the manner of universal whole to subjective parts, d2a2. "but as formals to materials; as also MathematICALS. d2b. "for: d2b1. "although metaphysical degrees are more UNIVERSAL than others, and can be compared to others as to subjective parts, for the reason that both abstractions can befit the same: d2b2. "nevertheless inasmuch as they stand under metaphysical: d2b2a. "they are not universals with respect to naturals d2b2b."but: d2b2b1. "forms, d2b2b2. "and Naturals are their matter." (Cajetan: Prooemium in De Ente et Essentia: Conclusio.)	d1b. "But TOTAL abstraction IS COMMON TO EVERY SCIENCE.

409. THREE DEGREES OF FORMAL ABSTRACTION: It is to be observed that the three degrees of formal abstraction are ANALOGOUS, just as being itself is analogous, that is essentially diverse. (Cf. nn. 148 - 159).

A. This diversity is already evident in the very enumeration which St. Thomas gives of these degrees (In Boethium De Trinitate, q, 5, a. 1);

a. "For certain of the speculables there are which depend on matter according to be, because only in matter can they be. And these are distinguished:

a1. "Because certain (of them) depend on matter both according to be and according to understanding, as do those IN WHOSE DEFINITION IS PUT SENSIBLE MATTER.

a1a. "wherefore they cannot be understood without sensible matter, as flesh and bones must be taken in the definition of man;

a1b. "and of these is PHYSICAL or NATURAL SCIENCE.

a2. "But:
a2a. "certain (of them):
a2a1. "although they depend on matter according to be,
a2a2. "nevertheless not according to understanding, because IN THEIR DEFINITIONS IS NOT PUT SENSIBLE MATTER; as line and number;
a2b. "and of these is MATHEMATICS.

b. "But there are certain speculables which DO NOT DEPEND ON MATTER ACCORDING TO BE:
b1. "because without matter they can be:
b1a. "whether it be that they are never in matter, as God and angel,
b1b. "or that in certain (cases) they are in matter, and in certain (cases) not, as substance, quality and act, one and many and such things:
b2. "about all of which is theology, that is, divine science, because the chief of the objects known in it is God. By another name it is called METAPHYSICS, that is transphysics:
b2a. "because after physics it occurs to be learnt by us
b2b. "to whom it befits to come to insensible things from sensible things." (In Boethium de Trinitate, q.5, a.1).

B. But this diversity is still more evident from this, that:

a. In the FIRST degree of abstraction "in which is absolutely considered some nature according to its essential character" (abstracted) "from all the parts, which are not parts of the species, but are accidental parts."

b. But in the SECOND degree a form is abstracted from matter.

b1. However:
b1a. Not indeed a substantial form, "because a substantial form and the matter corresponding to it depend on each other, so that one cannot be understood without the other, for this reason that a proper act is in its proper matter:
b1b. "but it is understood of an accidental form, which is quantity and figure, from which indeed sensible matter cannot be abstracted through understanding:
b1b1. "since sensible qualities cannot be understood unless quantity be pre-understood, as is clear in surface and colour:
b1b2. "neither also can a subject of movement be understood, which is not understood as quantic." (In Boethium De Trinitate, q.5, a.3).

b2. Nevertheless "since all accidents are compared to substance as form to matter, and the character of every accident whatsoever depends on substance, it is impossible that such a form be separated from substance.
b2a. "But accidents come to substance in a certain order. For:
b2a1. "first comes to it quantity,
b2a2. "next quality,
b2a3. "then passions and movement.
b2b. "Wherefore quantity can be understood in substance, before there be understood in it sensible qualities wherefrom it is called sensible matter:
b2b1. "and thus according to the notion of its substance:
b2b1a. "quantity does not depend on sensible matter,
b2b1b. "but on intelligible (matter) only.
b2b2. "For substance, accidents once removed, remains comprehensible only by intellect." (ibid.).

c. But it is clear that the THIRD degree of abstraction differs from the other two, from this, that it considers being abstracted from all matter:
c1. both intelligible,
c2. and sensible.

C. But the same is again evident from this, that in each degree "the term of knowledge is not always uniformly: for sometimes it is in sense, sometimes in imagination, sometimes in intellect alone.

a. "For sometimes the properties and accidents of a thing which are manifested by sense, sufficiently express the nature of the thing;
a1. "and then it behoves that the judgment about the true thing, which the intellect makes, be conformed to those things which sense manifests about the thing.

a2. "and such are all natural things, which are determined to sensible matter:

a2a. "and THEREFORE IN NATURAL SCIENCE KNOWLEDGE MUST BE TERMINATED AT SENSE, to wit, that we judge about things in this way according as sense manifests them......

a2b. "And these are NATURALS (PHYSICS) which are concreted with sensible matter and movement:

a2b1. "both according to be,

a2b2. "and according to consideration.

b. "But there are certain things the judgment of which does not depend on those things which are perceived by sense; because, although according to be they are in sensible matter, nevertheless according to character as defined they are abstracted from sensible matter.

b1. "But the best judgment about each thing is made according to character as defined.

b2. "But:

b2a. "because:

b2a1. "according to character as defined they do not abstract from all matter whatsoever, but only from sensible matter;

b2a2. "and, sensible conditions being removed, there still remains something imaginable;

b2b. "therefore IN SUCH THINGS IT BEHOVES THAT JUDGMENT BE TAKEN ACCORDING TO THAT WHICH IMAGINATION MANIFESTS.

b3. "Such are MATHEMATICS.

b4. "For in mathematics knowledge must according to judgment be terminated at imagination, not at sense, because mathematical judgment surpasses the apprehension of sense:

b4a. "wherefore there is not the same judgment sometimes on a mathematical line as on a sensible line;

b4b. "as in this, that a straight line touches a sphere only according to a point: which befits a separate straight line, but not a straight line in matter.

c. "But there are certain things which EXCEED both that which falls under sense, and that which falls under imagination; as those things which do not depend on matter, - neither according to be nor according to consideration: and therefore the knowledge of such according to judgment ought not be terminated at imagination nor at sense.

c1. "But nevertheless from those things which are comprehended by sense or imagination we come to the knowledge of these:

c1a. "either by way of causality; as when from an effect we know the cause, which is not commensurate to the effect, but excelling (it);

c1b. "or by excess;

c1c. "or by remotion, when we separate from such things all that sense or imagination apprehends.

c2. "Therefore:

c2a. "in divine science we can use sense and imagination:

c2a1. "as principles of our consideration,

c2a2. "but not as terms; to wit, that we should judge divine things to be such, as are those things which sense and imagination apprehend.

c2b. "But to be led to something is to be terminated at it;

d. "And:

d1. "therefore:

d1a. "IN DIVINE SCIENCE" (i.e. METAPHYSICS) "WE OUGHT TO BE LED NEITHER TO SENSE NOR TO IMAGINATION;

d1b. "BUT IN MATHEMATICS TO IMAGINATION and not to sense;

d1c. "BUT IN NATURAL (SCIENCE) TO SENSE.

d2. "And on account of this, they offend, who endeavour to proceed uniformly in the three departments of speculative science." (In Boethium de Trinitate, q.6, a.2).

410. SCHEMATIC SUMMARY: The contents of the fore-going article may be thus synoptically recapitulated:-

Speculative sciences are specified from the FORMAL REASON OF THEIR OBJECT:

- NOT as it is a THING (i.e. not from formal reason which).
- BUT as it is an OBJECT, i.e. as it is a SCIENTIFIC KNOWABLE: and so from the formal reason WHEREUNDER: This is taken
  - Not according to degrees of total abstraction:
    - For by this abstraction is got an object:
      - MORE POTENTIAL.
      - AND LESS KNOWN.
    - And this abstraction is common to every science.
  - But according to the diverse degrees of formal abstraction
    - For by this abstraction is got an object
      - MORE ACTUAL
      - AND MORE KNOWN.
    - The diverse degrees of this abstraction are analogous, and therefore ESSENTIALLY diverse,
      - From modes of defining
        - with matter
          - sensible: Then is had the FIRST DEGREE.
          - intelligible: Then is had the SECOND DEGREE.
        - without matter: Then is had the THIRD DEGREE.
      - From the terms of knowledge
        - either SENSE: Then is had the FIRST DEGREE.
        - or IMAGINATION: Then is had the SECOND DEGREE.
        - or INTELLECT: Then is had the THIRD DEGREE.

....

ARTICLE THREE.

THE DIVERSE SPECULATIVE SCIENCES.

411. THREE GENERA OF SCIENCES: From what has been said above, both about formal reasons WHEREUNDER, and about the degrees of abstraction:

A. It is clear that there are three GENERA of sciences:

B. Whereof:
a. The first is the genus of sciences in the first degree of formal abstraction (n.412);
b. The second is the genus of sciences in the second degree of formal abstraction (n.413);
c. The third is in the third degree of formal abstraction (n.414).

412. SCIENCES IN THE FIRST DEGREE OF ABSTRACTION: In the first degree of formal abstraction are had, not only that part of philosophy which is called NATURAL PHILOSOPHY (or PHILOSOPHY OF NATURE), but also the POSITIVE SCIENCES (or SCIENCES OF NATURE).

A. For these positive sciences, which, as said above (n.389, B), are about essences known only in their empiriological signs:
a. belong to the first degree of abstraction,
b. since the other degrees of abstraction are abstractions from sensible matter, about which the positive sciences are concerned.

B. These positive sciences are specifically diverse from natural philosophy, although both are about sensible being.

a. For NATURAL PHILOSOPHY knows essences in themselves, at least through their philosophical properties (cf. n.377, C):
a1. and it is more about movable being, although:
a1a. it is essentially distinguished from metaphysics,
a1b. and is naturally subordinated to it.
a2. And therefore the judgment of natural philosophy is terminated at sensible being.

b. But the NATURAL SCIENCES are about essences as occult which they know only in external signs (cf. n.377, C):
b1. and they are more about sensible being or about the observable,
b2. and naturally tend to resolve their judgments in the order of phenomena (of observables).

c. Therefore, although natural philosophy and the sciences of nature belong to the same degree of abstraction as regards elongation from matter, nevertheless as regards approach to immateriality they are not in the same case:

c1. For natural philosophy:
c1a. (although it is in the same degree of immateriality as the natural sciences: for both are about movable being),
c1b. attains movable being through a certain participation to metaphysical being and in a more intelligible manner, since it is:
c1b1. rather about movable being,
c1b2. than about movable being.

c2. But the natural sciences:
c2a. have no concern beyond the order of sensible observation,
c2b. and therefore:
c2b1. they attain the same material object indeed as natural philosophy (i.e. movable or sensible being),
c2b2. but they attain it through a certain participation to the knowledge of the senses and in a more sensible manner, since they are:
c2b2a. more about movable being,
c2b2b. than about movable being.

c3. But:
c3a. in every movement opposition as regards term determines specific diversity.
c3b. And therefore there is specific diversity between:
c3b1. the philosophy of nature,
c3b2. and the sciences of nature.

413. SCIENCES IN THE SECOND DEGREE OF ABSTRACTION: In the second degree of formal abstraction there is only one GENUS of sciences, to wit, MATHEMATICS, which, as said above (nn.389,409, B-C), is about quantity.

A. But:

a. The object of this science, to wit, quantity:
a1. since it abstracts:
a1a. from sensible matter,
a1b. not from intelligible matter,
a2. is verified:
a2a. not in sense,
a2b. but in imagination, as said above (n.409,C).

b. For this reason:

b1. the object of mathematics:

b1a. is not necessarily of the order of real being,

b1b. but has itself "permissively" relatively to real being and mental being (ens rationis), and is "indifferent to unreal quantity and true quantity" (John of St Thomas: Cursus Theol. I, q.6, disp.6, a.2, p.679).

b2. Wherefore mathematics is not to be numbered among the parts of philosophy, which are versed about realities.

B. "In the mathematical sciences:

a. "procedure is through those things only which are of the essence of the things only, since (these sciences) demonstrate through formal cause:

a1. "and therefore something is demonstrated about one thing:

a1a. "not through another thing.

a1b. "but through the definition proper to that thing." (In Boethium de Trinitate, q.6, a.1).

a2. In other words:

a2a. mathematics is science WHEREFORE (cf. n.389, A) or perfect science,

a2b. and as such, like metaphysics, is REGULATIVE of others (scientia RECTRIX - a QUEEN science).

C. Wherefrom it happens:

a. that there arise certain intermediary sciences (scientiae mediae):

a1. "which apply mathematical principles to natural things........

a2. "which however have more affinity to mathematics, because in their consideration:

a2a. "that which is physical, is as it were material,

a2b. "but that which is mathematical, as it were formal." (In Boethium de Trinitate, q.5, a.3, ad 6).

b. These PHYSICO-MATHEMATICAL sciences:

b1. although formally mathematical,

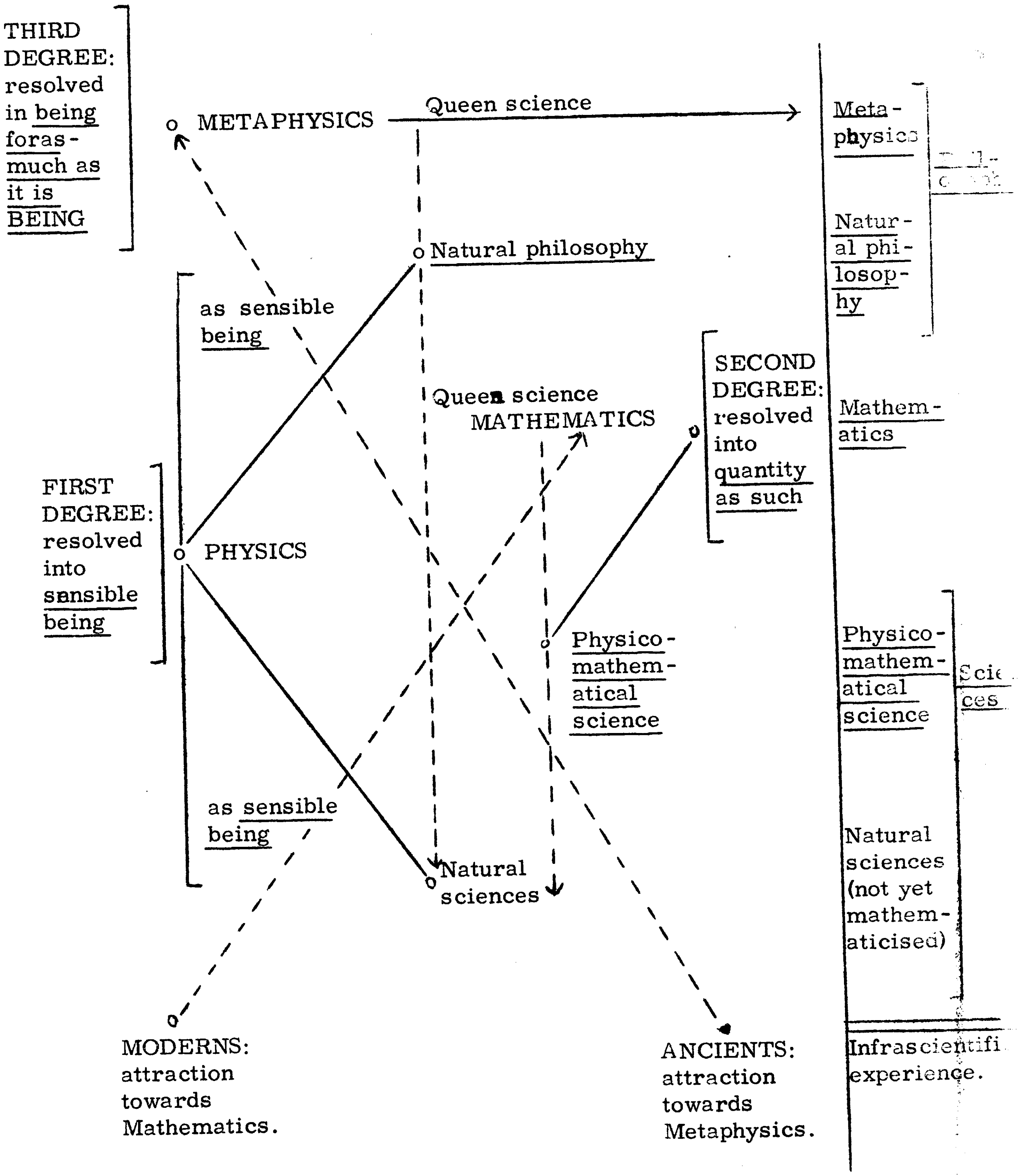
b2. are nevertheless more physical: "simply speaking they are natural sciences" as Cajetan rightly says, following St Thomas, who says with Aristotle: "that they are more natural." (II-II, q.9, a.2, ad 3).

414. SCIENCE IN THE THIRD DEGREE OF ABSTRACTION: In the third degree of formal abstraction is found only METAPHYSICS or FIRST PHILOSOPHY.

A. That there is found no positive science under this degree, is clear from this, that this degree of abstraction is abstraction from ALL matter.

B. Wherefore there is no room for any science other than first philosophy, which is about being forasmuch as it is being.

415. SCHEMATIC SUMMARY: All that has been said in the fore-going article upon the general division of sciences is summarized in the following schematic diagram, borrowed from the work of Maritain: Les Degres du Savoir', p.79).


THIRD DEGREE: resolved in being forasmuch as it is BEING
METAPHYSICS
Queen science
Natural philosophy
as sensible being
Queen science
MATHEMATICS
SECOND DEGREE: resolved into quantity as such
FIRST DEGREE: resolved into sensible being
PHYSICS
Physico-mathematical science
as sensible being
Natural sciences
MODERNS: attraction towards Mathematics.
ANCIENTS: attraction towards Metaphysics.
Metaphysics
Natural philosophy
Mathematics
Physico-mathematical science
Natural sciences (not yet mathematicised)
Infrascientific experience.

……

ARTICLE FOUR.

MODERN DIVISIONS OF THE SCIENCES.

416. CHIEF MODERN DIVISIONS OF :: Something is to be added now regarding the chief divisions of the sciences proposed by modern writers. They are:

A. The BACONIAN DIVISION, proposed by Francis Bacon (1561-1626), which will be dealt with first (n. 417).

B. The AMPERIAN DIVISION, proposed by A. M. Ampere (1775-1836), which will be dealt with next (n. 418).

C. The COMTIAN and SPENCERIAN DIVISION, proposed by Auguste Comte (1796-1857) and Herbert Spencer (1820-1903), which will then be considered (n. 419).

417. THE BACONIAN DIVISION: This will be first exposed, then judged.

A. EXPOSITION: Bacon divides the sciences subjectively according to the diverse faculties of the knower: to memory corresponds history; to imagination corresponds poetry; to reason corresponds philosop

a. HISTORY is subdivided into:
a1. natural history,
a2. civil history,
a3. and sacred history.

b. PHILOSOPHY is subdivided into three parts, to wit: the science of God, the science of nature, and the science of man.

b1. In the science of GOD occurs the treatment:
b1a. not only of God,
b1b. but also ofspirits of angels.

b2. The science of NATURE is divided thus:-

Science of nature:
- SPECULATIVE
  - Particular physics:
    - On the principles of things.
    - On the form of things.
    - On the diversity of things.
  - Appendices
    - On the measure of movements.
    - On natural problems.
    - Verdicts on the ancient philosophers.
  - Metaphysics
    - On forms.
    - On causes.
- PRACTICAL
  - Mechanics.
  - Natural magic.
- MATHEMATICS
  - Pure
    - Geometry.
    - Arithmetic.
    - Algebra.
  - Mixed
    - Perspective.
    - Mechanical mathematics.
    - Astronomy.
    - Cosmography.
    - Architecture.
    - Engineering.

b3. The science of MAN is divided thus:-

- Science of man:
  - In himself
    - In general
      - On the human individual.
      - On the union of soul and body.
    - In special
      - On the body
        - Medicine.
        - Athletics.
        - On enjoyments.
      - On the soul
        - sensible.
        - rational.
  - In society
    - Science of conservation.
    - Science of business.
    - Science of government.

c. POETRY is subdivided into:
c1. epic science;
c2. dramatic science;
c3. didactic science.

B. JUDGMENT UPON THE BACONIAN DIVISION:

a. This division has been extensively exposed in order that it may appear how Bacon:
a1. after first dividing sciences subjectively,
a2. then divides philosophy materially.

b. But:
b1. The question:
b1a. of the rectitude of this division is of less interest (since it is already evident from what has been said in previous articles above that it is not a right division),
b1b. than the question of the foundation of this division: which foundation is the empiricism of Bacon:
b1b1. in virtue of which science cannot be obtained save exclusively by means of observation of nature, by means of experience and by induction.
b1b2. From which it follows:
b1b2a. that a division according to formal objects is impossible,
b1b2b. only division according to material objects and faculties being possible.
b2. Moreover, these three faculties according to which Bacon divides the sciences:
b2a. are:
b2a1. neither of the same nature,
b2a2. nor independent of each other,
b2b. and concur in every intellective knowledge whatsoever.

418. THE AMPERIAN DIVISION: This will be first exposed, then judged.

A. EXPOSITION: Ampere divides the sciences on the score of their material object, into cosmological science (or sciences of natural things) and noetic sciences (or sciences of spiritual things).

a. The more general divisions are as follows:-

- Science
  - Cosmological
    - Properly so-called: about non-living things:
      - Mathematics
        - Properly co-called.
        - Physico-mathematics.
      - Physics.
    - Physiological: about living things:
      - Natural.
      - Medicinal.
  - Noetic
    - Properly so-called
      - Philosophy.
      - Noetechnics
    - Social
      - Ethnology.
      - Politics.

b. These last members are further subdivided, so that there are one hundred and twenty-eight lowest species of science.

B. JUDGMENT UPON THE AMPERIAN DIVISION: Although very different from the Baconian division:

a. This Amperian division:
a1. is based upon the same foundation, to wit, empiricism,
a2. which excludes the possibility of dividing the sciences according to degrees of abstraction.

b. Moreover, it is clear that the material object, since it is not of the order of scientific knowability:
b1. cannot specify the sciences,
b2. but, if taken as the principle of their specification, and according as the foundation of their division, would disgregate them into a numberless multitude.

419. THE DIVISION OF COMTE AND SPENCER: This, similarly, will be first exposed, then judged.

A. EXPOSITION:

a. COMTE, in elaborating a new classification of the sciences, wishes to establish the sciences, heretofore based on theology and metaphysics, on a positive (and positivist) foundation. By reason of the simplicity of their material object, he distinguishes three principal genera of sciences, proceeding from the more abstract and simple (concerned with the discovery of laws and therefore abstract) to the more concrete and composite (concerned with singular things, and therefore not abstract, but descriptive), thus:-

- Science
  - Most abstract and universal: Mathematics.
  - Less abstract and universal: Theoretical science:
    - Inorganic physics
      - Astronomy.
      - Physics properly so-called.
      - Chemistry.
    - Organic physics
      - Biology.
      - Sociology.
  - Least abstract and universal: Descriptive science: Concrete physics.

b. HERBERT SPENCER:

b1. Distinguishes three orders of science, thus:

- Science
  - Abstract
    - Mathematics.
    - Logic.
  - Abstracto-concrete or explicative:
    - Mechanics.
    - Physics.
    - Chemistry.
  - Concrete or descriptive
    - Astronomy.
    - Psychology.
    - Sociology.

b2. This division has affinity with the division proposed by Comte, and likewise proceeds by reason of the simplicity of the material object:

b2a. for the material objects of the abstract sciences are of greater simplicity than are those of the concrete sciences.

b2b. Indeed, Spencer distinguishes philosophy from scientific knowledge only according to degree of universality.

B. JUDGMENT UPON COMTE'S AND SPENCER'S DIVISION: Both these divisions proceed from positivism: for positivism being given, there can be no division save on the score of material object.

a. Positivism indeed:

a1. admits some abstraction, but only total (extensive) abstraction (cf. n.408):

a2. for which reason the object, even abstract:

a2a. does not become formal,

a2b. but, even endowed with some degree of universality, remains material.

b. Both divisions corrupt the notion of philosophy, according to the tenets of positivism, according to which our intellect cannot transcend the order of phenomena.

c. The opposition between descriptive and explicative sciences is unjustified: for explanation and description cannot be the foundation of the specification of sciences:

c1. since every science:
c1a. is in some respect descriptive,
c1b. and of itself tends towards explanation;
c2. for which reason sciences are unjustifiably distinguished through the differences 'concrete or descriptive' and 'abstract or explicative'.

CHAPTER THIRTY-NINE.

SUBALTERNATION OF SCIENCES.

420. ORDER OF PROCEDURE: This treatment of the subalternation of sciences:

A. Will deal:
a. First, with the notion of subalternation as understood here.
b. Secondly, with the subalternation exercised among the sciences: but since this subalternation is threefold, to wit, on the score of end, or the score of principles and on the score of objects, this treatment will consider:
b1. In the first place, their subalternation on the score of end;
b2. In the second place, their subalternation on the score of principles;
b3. In the third place, their subalternation on the score of objects.
c. Thirdly, the effect of subalternation upon the perfection of the subalternate science.

B. Hence the following order:-

- On the subalternation of the sciences:
  - Notion of subalternation......................Article one.
  - Subalternation exercised by the sciences:
    - On the score of end...........Article two.
    - On the score of principles....Article three.
    - On the score of objects.......Article four.
  - Effect of subalternation.....................Article five.

ARTICLE ONE.

NOTION OF SUBALTERNATION.

421. SPECIFIC DISTINCTION: SEPARATION OR INDEPENDENCE: AUTONOMY: With the specific distinction of sciences is not to be confused their separation or independence.

A. For two sciences may be specifically distinct from each other, without being separated from each other or independent of each other.
a. For distinction:
a1. is not division or separation, - which negates unity;
a2. but is lack of identity (cf. n.111), - which negates identity.
b. Nevertheless, modern writers, - illegitimately - use the notions 'distinct' and 'separate or independent' promiscuously, under the name of 'autonomy'.

B. But it is evident:
a. that specific distinction and independence are not synonomous terms.
b. And:
b1. though distinct sciences may be independent of each other,
b2. yet not all sciences are independent of each other.

C. The word 'autonomy' from its own force has more the meaning of independence than of specific distinction.
a. However, in point of fact, it is more often used today:
a1. to signify specific distinction,
a2. without implying utter independence.
b. Accordingly this term 'autonomy' is to be used with caution.

422. SUBALTERNATION AND ITS SPECIES: But sciences which depend on other sciences are said to be subalternate to them. And the sciences which hold another science under dependence on themselves are called subalternating sciences.

A. Therefore SUBALTERNATION is the state of subordination or of dependence of sciences upon each other.

B. But:
a. since in every science there may be considered three heads, on the score of which there may be subalternation, to wit:
a1. the end of the science,
a2. the principles of the science,
a3. and the object of the science;
b. subalternation among sciences is of three species.

……………………………………

ARTICLE TWO.

SUBALTERNATION BY REASON OF END.

423. PROPER TO PRACTICAL SCIENCES: This subordination is found only among practical sciences (cf. nn.396-401);

A. For practical sciences are the only sciences which move to act. (cf. nn.396-397).

B. But this subalternation on the score of end may be either proper or improper.

424. PROPER SUBALTERNATION ON THE SCORE OF END: If there is proper subalternation of the ends of two sciences:

A. in such fashion that the end of one has itself to the end of the other as a proximate end has itself towards an ultimate end,
a. that is, as essentially ordered towards that end of the other science,
b. just as for man as he is here and now called to a supernatural end, the end of moral philosophy is a natural end subordinate to the supernatural end of moral theology;

B. then:
a. these sciences are subordinated also at the same time:
a1. by reason of principles,
a2. and by reason of object;
b. because in practical sciences end and principles coincide.

C. In which case this subalternation is confused with subalternation by reason of principles or by reason of objects - dealt with in the two following articles.

425. IMPROPER SUBALTERNATION ON THE SCORE OF END: But subalternation of sciences on the score of ends may be otherwise:

A. to wit, in such fashion that the subalternating science uses the end of the subalternate science:
a. as an instrument, or as a means,
b. not as an end.

B. In this case:
a. there is no proper subalternation,
b. for:
b1. the subalternating and subalternate science pertain to the same science;
b2. since the same is the science:
b2a. which is about the end,
b2b. and which is about the means to that end.

C. In this fashion is moral philosophy conceived by those, such as Deman and Ramirez, who -
a. wrongly, as will be seen below (nn.499-502), -
b. think that for man called to the supernatural order, there is no longer a true moral philosophy specifically distinct from sacred theology.

....

ARTICLE THREE.

SUBALTERNATION BY REASON OF PRINCIPLES.

426. TWOFOLD SUBALTERNATION BY REASON OF PRINCIPLES: Subalternation by reason of principles is had when one science gets its principles from another science.

A. Thus:
a. does sacred theology borrow its principles from the science of the blessed (of the beatified, i.e. of those having the beatific vision).
b.does natural philosophy get its principles from metaphysics.

B. But not in the same way.

427. SUBALTERNATION SIMPLY TAKEN: For sacred theology borrows its principles from the science of the blessed in such fashion that these principles are evident only in the science of the blessed, and cannot be resolved by sacred theology into self-evident principles.

A. In other words, only in the science of the blessed, are the principles of sacred theology seen.

B. Such subalternation, IN WHICH THE SUBALTERNATE SCIENCE HAS ONLY PRINCIPLES MANIFESTED BY ANOTHER SCIENCE, so that from itself it does not resolve them into self-evident principles, is called SUBALTERNATION SIMPLY SPEAKING.

C. These sciences, to wit, the subalternate and the subalternating:
a. although they are concerned about the same material object,
b. nevertheless:
b1. attain it under a diverse formal reason whereunder (nn.403-405),
b2. and so are NOT subordinated BY REASON OF OBJECT.
c. Therefore they are specifically distinct from each other. (Cf.n.406).

428. SUBALTERNATION IN A QUALIFIED SENSE: But between natural philosophy and metaphysics the subalternation of principles is otherwise.

A. For natural philosophy:

a. from itself resolves its principles into self-evident principles, and so sees its own principles;

b. nevertheless from metaphysics it gets certain principles TO PROVE SIMPLY OR TO DEFEND ITS OWN PROPER PRINCIPLES: for the principles of natural philosophy, in the order of the first degree of abstraction:

b1. though self-evident indeed,

b2. are only contractions of principles of metaphysics whereby they are defended.

B. Thus the principle of the composition of bodies from matter and form:

a. self-evident indeed in the order of natural philosophy,

b. is a contraction of the metaphysical principle of the division of being into potency and act.

C. Such subalternation, IN WHICH THE SUBALTERNATE SCIENCE NEVERTHELESS RESOLVES ITS PRINCIPLES INTO SELF-EVIDENT PRINCIPLES, is called SUBALTERNATION IN A QUALIFIED SENSE (secundum quid).

429. SUMMARY: Accordingly:

A. SUBALTERNATION SIMPLY SPEAKING:

a. is had when one science depends on another for the seeing of its principles (not itself seeing them);

b. And thus is sacred theology subalternate to the science of the blessed.

B. But SUBALTERNATION IN A QUALIFIED SENSE:

a. is had when one science depends on another:

a1. not indeed for the seeing of its principles (for itself sees them)

a2. but for the defence of its principles.

b. And thus is natural philosophy subalternate to metaphysics.

……………………………

ARTICLE FOUR.

SUBALTERNATION BY REASON OF OBJECTS.

430. SUBALTERNATION OF INTERMEDIARY SCIENCES: Besides the subalternations so far mentioned, there is found another mode of subalternation, to wit, that of intermediary sciences. (Cf. n.413, C).

A. Let us take the example of physico-mathematical science:

a. Materially it is concerned about the same object as physical science;

b. however, FORMALLY, by an accidental difference, its object is distinguished from the object of mathematics:

b1. for its proper object is the same as the object of mathematics,

b2. but with an accidental difference borrowed from physical science (and foreign to the specific nature of the object of mathematics).

B. By reason of this accidental difference, physico-mathematical science is subordinated on the score of its object to mathematics.

a. It differs indeed specifically from mathematics, because its formal object contains something which is not contained under the object of mathematics.

a1. It would not indeed differ specifically, if the difference were specific, so that one would be about the genus while the other were about the species: for genus and species are considered by the same science.

a2. Neither would it differ specifically, if one were about a subject, while the other were about its properties: for a subject and its properties are considered by the same science.

c. "'Per se' the habit of the proximate principles of the subalternate science is the subalternating scientific habit.

d. "The subalternating and subalternate science are not necessarily opposed on the part of (material) object nor on the part of subject (formal object), but rather on the part of the conditions of the medium: to wit, because the medium in the subalternating science is immediately joined to self-evident principles, but (the medium) of the subalternate science mediately, to wit, by the medium of a habit of another species." (Cajetan: ibid.).

d1. But where there is not this opposition on the score of object (material or formal):

d1a. there is not had an intermediary science,

d1b. nor a science subordinated by reason of its object,

d1c. but a science subordinated by reason of its principles only.

d2. Such is the case with sacred theology:

d2a. which is about the same object as the science of the blessed,

d2b. and yet is subordinated to that science by reason of its principles, which it receives from that science (receiving them, in the theologian not yet having the beatific vision, by the medium of faith).

....

ARTICLE FIVE.

EFFECT OF SUBALTERNATION.

432. A SUBALTERNATE SCIENCE IS THE SAME HABIT WHEN IT HAS CONTINUITY WITH THE SUBALTERNATING SCIENCE AND WHEN IT HAS NOT CONTINUITY THEREWITH: This question is raised on account of the state which sacred theology has in us (in theologians who have not the beatific vision), in whom sacred theology gets its principles from the science of the blessed without resolving them into self-evident principles (without seeing them), but only believes them.

A. Thus:

a. In the theologian not together having the science of the blessed:

a1. sacred theology is not in continuity with the science wherefrom it takes its principles (i.e. with its subalternating science),

a2. so that this theologian does not at all see his principles.

b. Whereas in the theologian who together has the science of the blessed:

b1. sacred theology is in continuity with the science wherefrom it takes its principles,

b2. so that this theologian:

b2a. though not by his habit of theology does he see its principles,

b2b. nevertheless sees them (by the medium of his other science).

B. It must be said indeed that the habit of such non-continued subalternate science is the same habit as if it were continued. For it demands, and is inclined unto, continuation therewith:

a. For one who acquires the habit of the subalternate science separately from the subalternating science 'per se' proceeds from principles presuppositively evident.

b. Which would not be the case if it did not 'per se' incline to their manifestation: which is effected through continuation with the subalternating science.

C. Therefore:

a. it must be said:

a1. that for this habit of science:

a1a. there is not substituted another,

a1b. but the same habit is perfected by continuation;

a2. for if continuation destroyed the habit, in vain would it demand the continuation.

b. Therefore the habit of the subalternate science is the same:

b1. whether it be in continuity,

b2. or be not in continuity.

433. NEVERTHELESS THIS HABIT IS IN AN IMPERFECT STATE IN A SUBJECT WHO CANNOT IN POINT OF FACT RESOLVE ITS PRINCIPLES IN THE SUBALTERNATING SCIENCE: From what has been said just above:

A. This conclusion is evident, since:
a. that it be in continuity indicates a perfect state of it,
b. and that it be not in continuity indicates an imperfect state of it.

B. Nevertheless this state of imperfection is diverse according as the non-continued subalternate science assumes from the subalternating science:

a. Principles pre-suppositively and radically certain: which is the case whenever the subalternat4 science is based on the fallible authority of a higher science.

b. Or principles actually certain, although not evident: as is the case with sacred theology (in the theologian not having the science of the blessed), for this theology is based upon infallible faith.

....

SCHEMATIC SUMMARY.

434. SCHEMATIC RECAPITULATION: What has been said regarding the subalternation of sciences may be thus schematically summarised: -

Subalternation
- OF PRACTICAL SCIENCES occurs by subalternation of ends, so that the end of the one is subordinated to the end of the other: and then:
  - either as a proximate end to an ultimate end:
    - Then the two are specifically distinct sciences:
    - And then is had proper subordination of ends.
    - Thus is moral philosophy subalternate to sacred theology.
  - or as a pure means to an end:
    - Then the subalternate is absorbed by the subalternating, and the two are not specifically distinct sciences.
    - And then is had improper subordination of ends.
    - Thus according to Deman and Ramirez would moral philosophy be absorbed by sacred theology.
- OF SPECULATIVE SCIENCES occurs by reason of principles: and then:
  - either of principles only: and then:
    - either simply: thus is sacred theology subalternate to the science of the blessed: for from itself it does not resolve its principles.
    - or in a qualified sense: thus are the diverse sciences subalternate to metaphysics: for from themselves they resolve their principles.
  - or also of objects: This is the subalternation of intermediary sciences.

....
....

SECTION NINE.

SCIENCES IN SPECIAL.

435. ORDER OF PROCEDURE: Having exposed those considerations which pertain to science *in general*, we come now to examine diverse questions which are concerned about the sciences *in special*.

A. However this examination will be restricted to those things which belong to a *philosophical* consideration of the sciences.

B. Regarding *philosophy itself* no more will be said here, since what concerns it has been said, or is said, in appropriate places.

C. With respect to the *method* of the diverse sciences:
a. this will be indicated here *in general* only;
b. to speak of it in special, pertains to the respective sciences themselves

D. Accordingly this treatment of the sciences in special:

a. Will consider:
a1. *First*, mathematical science.
a2. *Secondly*, the sciences of nature.
a3. *Thirdly*, moral science.
a4. *Fourthly*, sociology.
a5. *Fifthly*, history.

b. Hence the following order:-

On the sciences in special:
- Mathematical science......................Chapter forty.
- The sciences of nature....................Chapter forty-one.
- Moral science.............................Chapter forty-two.
- Sociology.................................Chapter forty-three.
- History...................................Chapter forty-four.

……

CHAPTER FORTY.

MATHEMATICS.

436. ORDER OF PROCEDURE: This treatment of mathematical science:

A. Will deal with:
a. *First*, mathematical notions.
b. *Secondly*, mathematical principles.
c. *Thirdly*, mathematical demonstration.

B. Hence the following order:-

On mathematics	Mathematical notions	Article one.
	Mathematical principles	Article two.
	Mathematical demonstration	Article three.

……

ARTICLE ONE.

MATHEMATICAL NOTIONS.

437. ORDER OF PROCEDURE: This article devoted to mathematical notions:

A. Will consider:
a. *First*, the object of mathematics.
b. *Secondly*, number.
c. *Thirdly*, geometrical notions.
d. *Fourthly*, the origin of geometrical notions.
e. *Fifthly*, mathematical definitions.

B. Hence the following order:-

On mathematical notions	The object of mathematics	Dissertation one.
	Number	Dissertation two.
	Geometrical notions	Dissertation three.
	Origin of geometrical notions	Dissertation four.
	Mathematical definitions	Dissertation five.

……

DISSERTATION ONE.

OBJECT OF MATHEMATICS.

438. THE OBJECT IS QUANTITY: Mathematics is about *quantity*, concerning which it conducts an investigation of its properties.

439. TWOFOLD QUANTITY: But quantity is twofold, to wit:

A. *Discrete* quantity or *number*: which is dealt with by:
a. *arithmetic*,
b. and *algebra*.

B. *Continuous* quantity: which is dealt with by *geometry*.

……

DISSERTATION TWO.

NUMBER.

440. NATURE OF NUMBER: Regarding this it must be said that:

A. DISCRETE quantity or NUMBER arises from actual separation of the parts of quantity.

B. From this separation results a multitude, which:
a. if it be numbered or measured by some unit of quantity,
b. constitutes predicamental or quantitative number.

441. FINITE NUMBER: But:

A. Number:
a. concerning which mathematics treats:
a1. not only abstracts from the individual and sensible be which quantity has in things,
a2. but abstracts in the second degree of abstraction, which:
a2a. considers quantity solely in intelligible matter (cf. nn.409, 413),
a2b. and resolves it to imagination, as said above (n.409, C).
b. Therefore:
b1. according to itself, or from its own force, it is INDIFFERENT TO HAVE REAL BE OR MENTAL BE ONLY:
b2. which is of the highest importance for determining the nature of the diverse numbers whereof the mathematician treats.

B. Number which is directly abstracted from real quantity is called an integral number.

C. But this NUMBER, or quantity measured by one, and the very UNIT itself, the principle of number:

a. Can be measured by another unit LESS than the common number and its principle;
a1. then is obtained a rational number or proportion;
a2. thus, for example, the number 3, first measured by one or 1, can be again measured by another unity, which is the third part of the former unity; then is had the rational number:

$$\frac{1}{3} \times \frac{3}{3} = \frac{3}{9}$$

b. Therefore RATIONAL NUMBER may be defined: A NUMBER WHOSE UNITY IS AN INTEGRAL PART OF A FORMER MEASURE, i.e. A PART WHICH IS MANY TIMES INTEGRALLY CONTAINED IN A FORMER UNITY OF MEASURE, v.g. a third part of the measure.

D. But it may happen that NO unit is found COMMON to the measure and the measured:
a. then is obtained an irrational number:
b. for example:

b1. $\pi = 3.1415926533589;$

b2. $\sqrt{2} = 1.414213......$

E. All these numbers are finite, just as in an integral number;
a. so that rational and irrational numbers are finite.
b. For it is repugnant that a quantity measured by a unity be infinite (indefinite).

442. TRANSFINITE NUMBER: Nevertheless:

A. Mathematicians speak:

a. not only of finite number,

b. but also of transfinite number, or indeterminate number, or rather, of number whose determination is not utterly rigorous:

b1. For example:
b1a. let X be a transfinite number; then:
b1a1. since X is not rigorously determinate,
b1a2. it can rightly be said:

$$X = x + 1.$$

c. Authors dispute as to:
c1. what value this number has,
c2. and whence does it arise.

B. Some say that transfinite number:
a. is:
a1. a MERE CONVENTION,
a2. and arises from some 'a priori' form.
b. Thus speak IDEALISTS, according to whom mathematical notions are constructed by intellect freely, without the intervention of experience.

C. But others say that:
a. transfinite number:
a1. IMPLIES CONTRADICTION,
a2. since there is no corporeal quantity which is not finite.
b. Thus speak EMPIRICISTS, who recognise only one fount of knowledge, to wit, sensible experience.

D. BUT THE TRUE ANSWER IS that transfinite number is MENTAL BEING BASED IN THE REAL (ens rationis fundatum in re), that is, based in predicamental (real) quantity, not indeed immediately, but mediately.

a. For transfinite number is obtained by an analogical transposition:
a1. from the order of mathematical quantity (of the second degree of abstraction),
a2. to the order of TRANSCENDENTAL MULTITUDE (of the third degree of abstraction).

b. This transposition:
b1. is legitimate BY REASON OF THE NATURE OF THE SECOND DEGREE OF ABSTRACTION,
b2. according to which mathematical quantity has itself indifferently relatively to:
b2a. real being (ens reale),
b2b. and mental being (ens rationis).

c. Therefore TRANSFINITE NUMBER:
c1. directly pertains:
c1a. not to predicamental (real) number,
c1b. but to transcendental multitude, which according to itself or from its own force is:
c1b1. neither finite,
c1b2. nor infinite.
c2. Indirectly however it is reduced to finite number, inasmuch as:
c2a. by the medium of analogical transference to the transcendental order,
c2b. it:
c2b1. is based on predicamental quantity,
c2b2. and relatively to it is indirectly verified in imagination.

……………………………………

DISSERTATION THREE.

GEOMETRICAL NOTIONS.

443. GEOMETRY IS ABOUT CONTINUOUS QUANTITY: Geometry is about continuous quantity:

A. Which:

a. although it is not actually divided,
b. can be divided indefinitely into parts which before the division are distinct only in potency, as is shown in natural philosophy.

B. To the continuum pertains:
a. both the permanent continuum,
b. and the successive continuum, i.e.
b1. time,
b2. and local movement which conjoins both continua.

444. DIMENSIONS OF THE CONTINUUM: With regard to dimensions it is necessary to distinguish as follows:

A. The permanent continuum, which exists in bodies, manifests three dimensions, to wit: length, breadth, and depth.
a. Voluminal quantity or volume is a continuous quantity constituted with three dimensions, to wit, length, breadth and depth.
b. Superficial quantity or surface is a continuous quantity constituted with two dimensions, to wit, length and breadth.
c. Linear quantity or line is a continuous quantity constituted with one sole dimension, to wit, length.

B. But the successive continuum exhibits one dimension only.

445. PERMANENT CONTINUUM AS OBJECT OF GEOMETRY: Of the permanent continuum geometry considers the regular figures (shapes), or qualities constituted from the diverse dimensions, as are the straight line, the curved line, the triangle, the parallelogram, the cylinder, the sphere, and so on.

446. SUCCESSIVE CONTINUUM AS OBJECT OF GEOMETRY: Likewise, geometry considers the successive continuum in the study of functions:

A. These functions are defined: the correspondence of some series of values of one quantity, which is called a dependent variable, to the values of another which is called an independent variable.

B. These functions are graphically represented by means of two axes according to which the "co-ordinate" values of any binary or "point" are determined.

C. There are:
a. many genera of functions;
b. amongst which as the principal may be reckoned, on account of their theoretical properties and innumerable applications in the nature of things, continuous functions, which, the independent variable being varied in a continuous manner, are likewise varied in a continuous manner.

....

DISSERTATION FOUR.

ORIGIN OF GEOMETRICAL NOTIONS.

447. THE QUESTION: The question regarding the origin of geometrical notions arises from the regularity of geometrical figures, which are not found in sensible things.

A. Indeed there is not found in the nature of things a line perfectly straight, nor a circle perfectly round, from which, leaving individuality alone behind, we can abstract the nature of a straight line or of a circle.

B. The EMPIRICISTS endeavour to answer this question:
a. by saying that we rectify the almost exact figures found in nature.

b. But they cannot explain how this rectification can be made without a norm previously known of perfectly regular figures.

C. Modern CONCEPTUALISTS,
a. more or less Idealists:
a1. not being able to explain true geometrical figures from experience,
a2. teach that they are 'a priori' creations of our mind.
b. This answer:
b1. is indeed coherent with idealism,
b2. but not with moderate realism.

448. THE TRUE ANSWER: And so it must be said that geometrical notions are obtained through abstraction from sensible experience:

A. But:

a. Not through that abstraction of the first degree which:
a1. leaves behind individuality alone,
a2. retaining however sensible qualities;

b. But, just as in the case of numbers:
b1. by abstraction of the second degree:
b1a. which abstracts:
b1a1. both from individuation,
b1a2. and from sensible qualities,
b1b. retaining only:
b1b1. intelligible quantity,
b1b2. with the qualities proper to it.
b2. But this degree of abstraction:
b2a. since it verifies its concepts in imagination,
b2b. can imaginatively reproduce figures:
b2b1. according to things that we see in nature,
b2b2. but in employing nothing save quantity and its properties.

B. Thus:

a. "Among lines which join two points:
a1. "we see some to be shorter than others;
a2. "therefrom we are led to conceive one line which is shorter than all others, which we call:
a2a. "the distance between the two points,
a2b. "or the direction,
a2c. "or the straight line passing through those points.

b. "But:
b1. "the notion of a straight line once formed,
b2. "it is easy to obtain the notion of a plane surface, through the continuous movement of some straight line constantly passing through one fixed point and intersecting another fixed straight line;

c. "Then of a parallel, or straight line which, on the same plane as the other, has the same perpendicular.

d. "Finally, of circumference, or of a line all the points of which are on the same plane, equidistant from one point; etc." (Geny: Critica, pp.351-352).

....

DISSERTATION FIVE.

MATHEMATICAL DEFINITIONS.

449. MATHEMATICAL DEFINITIONS ARE EITHER ESSENTIAL OR GENETIC: From the very nature of mathematical notions it follows that the definitions found in these sciences are:

A. Either ESSENTIAL, i.e. expressing THE VERY ESSENTIAL NOTES, OR PROPERTIES: (cf. nn.169-170): for example:

a. this definition of a circle: 'line every point of which is equidistant from one point';

b. this definition of a straight line: 'the shortest line between two points'.

B. Or GENETIC, i.e. indicating the MANNER IN WHICH THE NOTION IS FORMED (cf. nn.169-170): for example:

a. this definition of a circle: 'figure arising on one plane from the rotation of one point so moved as to keep the same distance from another point';

b. this definition of six: 'number obtained by five times making to one an addition of one'.

....

SCHEMATIC SUMMARY.

450. SCHEMATIC SYNOPSIS: The contents of the fore-going article may be thus schematically summarized:-

On mathematical notions:
- On number
  - Its nature: Multitude resulting from actual separation of the parts of quantity, measured by a quantitative unity.
  - Its analogous division: it is
    - either real number: IMMEDIATELY based in real quantity: FINITE number: this is
      - either INTEGRAL number, directly abstracted from real quantity.
      - or NON-INTEGRAL number: this is
        - either Rational.
        - or Irrational.
    - or non-real number or transfinite number: MEDIATELY based in real quantity (and therefore mental being with foundation in the real).
- On geometrical notions
  - Their nature
    - Their OBJECT: the continuum: which is
      - either Permanent: line, surface volume.
      - or Successive: variables.
    - Their DEFINITIONS are
      - either essential.
      - or genetic.
  - Their origin
    - is NOT
      - by a rectification of the figures of things, as say EMPIRICISTS.
      - by an 'a priori' creation of the mind, as say IDEALISTS.
    - BUT IS by abstraction of the second degree.

....

ARTICLE TWO.

MATHEMATICAL PRINCIPLES OR PROPOSITIONS.

451. ORDER OF PROCEDURE: This consideration of the principles of mathematics:

A. Will consider:
a. *First*, the distinction which mathematicians make between axioms and postulates.
b. *Secondly*, the nature of the postulates.

B. Hence the following order:-

On the principles of mathematics:	The distinction between axioms and postulates..................	Dissertation one.
	The nature of the postulates...........	Dissertation two.

....

DISSERTATION ONE.

"AXIOMS" AND "POSTULATES".

452. TWOFOLD GENERA OF PRINCIPLES: Besides the *notions* which are the *remote* matter (cf. n.245) of mathematical demonstration:

A. There are found in these sciences *proper* principles, which are the *proximate* matter of the same demonstration.

B. But according to mathematicians, these principles would be of two genera, to wit:
a. *axioms*,
b. and *postulates*.

453. "*AXIOMS*": They call "axioms" self-evident propositions: such are these: '*two equals to the same third are equal to each other*': '*from point to point a straight line can be drawn*'; '*from a given point, with a certain radius, a circle can be drawn*'.

454. "*POSTULATES*": On the contrary, they call "postulates" indemonstrable propositions which, although they are not self-evident, are admitted without demonstration.

A. Thus the three "postulates" of Euclid:

a. '*All right angles are equal*'.

b. '*From a point on a plane, outside a certain line, only one parallel to that line can be drawn*'.

c. '*Two straight lines do not circumscribe a surface*'.

B. Among these, the second is famous under the title of "*the Postulate of Euclid*".
a. "Among the authors who have written upon it, *Legendre* says:to it is equivalent this assertion: '*the sum of the angles of a triangle is equal to two right-angles*'.
b. "It is well known that through the centuries innumerable authors have endeavoured to demonstrate '*the Postulate of Euclid*':

b1. "but without success;
b2. "nevertheless for one postulate another can be substituted." (Dario: Praelectiones Cosmologicae, p.73).

……………………………

DISSERTATION TWO.

NATURE OF THE "POSTULATES".

455. DOCTRINE OF THE ANCIENTS: The ancients taught:

A. That the postulates:
a. are not of another genus than the axioms;
b. and therefore are propositions self-evident or immediately evident.

B. And that they do not differ from the axioms save inasmuch as:
a. they are less universal,
b. and are more apt to enter into the very process of science.

456. DOCTRINE OF MODERNS: Many moderns, although unanimous in denying the evidence of the postulates, diversely explain them:

A. Some deny the certitude of the postulates:

a. Certain authors, such as Dugald Stewart and John Stewart Mill:
a1. in accordance with the tenets of empiricism,
a2. teach that the postulates:
a2a. arise from definitions obtained by induction,
a2b. and as such are only hypothetical.

b. H.Poincare (Science et Methode, p.121):
b1. teaches that the postulates are only more or less commodious conventions.
b2. Thus he admits that the Euclidian geometry is more commodious than other geometries.

B. Others, on the contrary, admit the certitude of the postulates:

a. Kant explains this certitude by the aid of 'synthetic a priori' principles, in accordance with his subjectivist principles.

b. Bertrand Russel, on the contrary, says that:
b1. the postulates are truths of experience,
b2. and are neither more nor less certain than certain other facts.

457. SOLUTION: But it must be said that THE EUCLIDIAN POSTULATES ARE PROPOSITIONS MATHEMATICALLY INDEMONSTRABLE, BUT PHILOSOPHICALLY DEMONSTRABLE from the very nature of quantity.

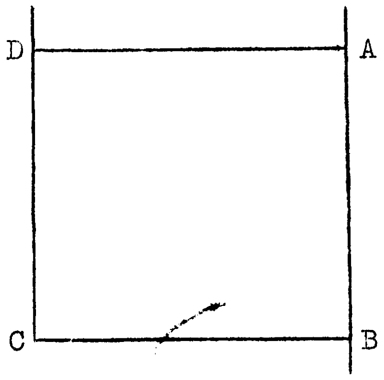
A. But for the enacting of this proof:
a. it is necessary to have a right notion of quantity itself, i.e. to have:
a1. the objective notion,
a2. not a subjective notion, which in point of fact most modern writers, more or less imbued with the tenets of idealism, have;
b. for the postulates are nothing else than explanations of the notion of quantity.

B. The 'Postulate of Euclid' is thus demonstrated PHILOSOPHICALLY:

a. Now:
a1. let there be the line AB;
a2. and let C be a point on the same plane, outside AB.

b. It is to be proved that from the point C only one parallel to AB can be drawn.

c. Let D be a point:
c1. on the same plane,
c2. equally distant from A, as C is from B,
c3. and so placed that a line from C to D does not intersect AB (i.e. let it be placed on the same side of AB as is C.)



d. Now:

d1. Every parallel to AB drawn from C:
d1a. must be equally distant from AB,
d1b. and therefore must pass through D.

d2. But through D can pass only one line drawn from C. For a point:
d2a. is not a part of a line indeed,
d2b. but is an indivisible terminating or continuing a line, or, in other words, a mode of a line, inseparable from the line.

d3. But the same mode of a line can belong to one line alone.

d4. Therefore from C one line alone can pass through D.

d5. Therefore from C only one parallel to AB can be drawn.

458. NATURE OF NON-EUCLIDIAN POSTULATES: But regarding non-Euclidian postulates ANOTHER VERDICT MUST BE GIVEN:

A. ORIGIN OF NON-EUCLIDIAN GEOMETRIES:

a. "Direct proofs of the 'Postulate of Euclid' remaining unsuccessful, FATHER SACCHERI S.J., attempted a new way (Euclides ab omni naevo vindicatus, 1733):
a1. "he endeavoured to deduce those who would deny the axioms to some contradiction;
a2. "but contradiction was not found.
a3. "And something other, foreign quite to his intent, did Saccheri obtain: he became the precursor of those who propound 'non-Euclidian' geometries.

b. "Non-Euclidian geometries are series of deductions logically connected without internal contradiction, starting from a 'beginning' which is to some extent diverse from the Euclidian 'beginning'.

b1. "LOBATCHEWSKY (1829) and BOLYAI (1832) separately, propounded a geometry wherein the sum of the angles of a triangle is supposed to be less than the sum of two right-angles; or, equivalently: many parallels to a certain straight line from a point of the plane are supposed to be possible.

b2. "Then RIEMANN (1854) propounded another geometry based upon this supposition: all the straight lines of a plane intersect a certain line; there are no parallels; or, in other words, the sum of the angles of a triangle exceeds the sum of two right-angles.

b3. "Later, the same RIEMANN (1865), HELMHOLTZ, and others, through another method fashioned innumerable geometries: to wit, they excogitated diverse spaces. For RIEMANN taught these things:

b3a. "The nature of space is to be deduced from the concept of it; and the concept of space cannot be determined, unless it be taken under a wider concept. Now this wider concept is the concept of multiplicity many times extended; and under this generic concept Euclidian space - real space - is: multiplicity triply extended. But the same generic concept admits also other determinations, namely, multiplicities twice, once or four-times, five-times.............extended. Whence spaces of any number of dimensions.

b3b. "Moreover, they say, spaces may be diverse by reason of their form: Euclidian space - real space - is 'plane', because it verifies the axiom of parallels; the other spaces are 'curved': spherical, pseudo-spherical; - of uniform curvature (like a sphere) or of variable curvature (like a hat); - of positive or negative curvature, etc." (Dario: Praelectiones Cosmologicae, pp. 75-76).

B. VALUE OF NON-EUCLIDIAN GEOMETRIES:

a. On account of this origin:

a1. Modern writers regard these postulates as mere freely chosen conventions, without foundation in reality; and this indeed logically according to the tenets of idealism.

a2. But they cannot explain how the use of them could be in many cases successful, unless they admit:

a2a. Either:
a2a1. that these geometries are equally with the Euclidian in accord with reality.
a2a2. But falsely would this be admitted:
a2a2a. for neither contradictories nor contraries can be true together;
a2a2b. but the Euclidian postulates and those of the other non-Euclidian geometries are contrarily or contradictorily opposed.

a2b. Or, as some say, that these successes follow only accidentally ('per accidens': by way of fluke) from false principles.

b. On the contrary, IT IS TO BE SAID that the VALUE of these geometries is one thing, while their APPLICATION to reality is another.

b1. If their VALUE be considered:
b1a. It is sufficient that the deductions in each series of postulates be logical and without internal contradiction (or, in other words, be according to the laws of formal logic);
b1b. For from its own force, geometry, as said above (n.413, A.b):
b1b1. is not about real being,
b1b2. but is about being which has itself indifferently to real being and mental being.

b2. But if their APPLICATION to reality be considered: then by the very fact that it is their application to reality that is being considered:
b2a. it is no longer question of pure geometry,
b2b. but of applied geometry: and then it is to be said that this use:
b2b1. cannot be made directly: which those writers themselves implicitly confess, when they teach that no figure can be constructed on the basis of these postulates;
b2b2. yet can be made indirectly by an analogous transference into the Euclidian geometry, from which, by a transference in the opposite direction, they had their beginning.

c. For these postulates:
c1. although nothing in the real directly corresponds to them, and they are mental beings (entia rationis), nevertheless:
c1a. are not, as certain writers say, fictitious beings without foundation in the real. (i.e. they are not unbased mental beings: cf. nn. 108-111),

c1b. but are mental beings with foundation in reality, to wit, in predicamental quantity.

c2. For:

c2a. from the Euclidian postulates, which are directly founded in predicamental quantity, viz. in the negation of them, do these non-Euclidian postulates analogically have their origin;

c2b. and therefore in them can they indirectly be imaginatively verified.

....

SCHEMATIC SUMMARY.

459. SCHEMATIC SYNOPSIS: The contents of the fore-going article may be thus schematically recapitulated:-

- On mathematical principles
  - AXIOMS: are self-evident propositions.
  - POSTULATES
    - Euclidian
      - ARE NOT
        - Hypotheses obtained by induction, as say EMPIRICISTS.
        - Commodious conventions, as says POINCARÉ.
      - BUT ARE propositions
        - Mathematically indemonstrable.
        - Philosophically demonstrable or self-evident.
    - Non-Euclidian
      - ARE NOT
        - Conventions without foundation in reality.
        - Immediately abstracted from reality.
      - BUT
        - are mental beings to which nothing in the real corresponds DIRECTLY.
        - Yet with an INDIRECT foundation in reality.

....

ARTICLE THREE.

MATHEMATICAL DEMONSTRATION

460. ORDER OF PROCEDURE: This treatment of mathematical demonstration:

A. Will consider:

a. First, whether mathematical demonstration is deductive.

b. Secondly, whether mathematical demonstration is inductive.

c. Thirdly, whether mathematical deduction is of another species than in other sciences.

B. Hence the following order:-

On mathematical demonstration:
- Whether it be deductive..............................Dissertation one.
- Whether it be inductive.............................Dissertation two.
- Whether deduction in in mathematics be of diverse species than in other sciences....................................Dissertation three.

....

DISSERTATION ONE.

IN MATHEMATICS THERE IS TRUE DEDUCTION.

461. OPINIONS DENYING DEDUCTION IN MATHEMATICS: The question whether in mathematics there be true deduction is raised on account of:

A. Those who, like GOBLOT (Traite de Logique, 5me ed., p.266), deny that there is true deduction in mathematics.

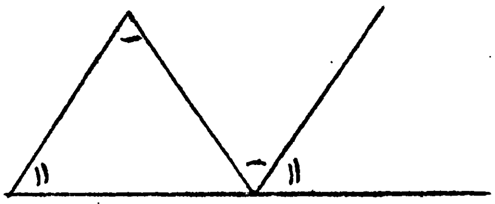
B. Those who, like BRUNSCHVICQ, continually set in opposition to each other:
a. deduction,
b. and mathematical reasoning.

462. TRUE DEDUCTION IN MATHEMATICS: But that in reality there is true deduction in mathematics:

A. Is easily proved from the very example of mathematical reasoning advanced by Goblot: to wit: from the demonstration that the sum of the angles of a triangle is equal to two right-angles.

B. For the demonstration is enacted thus:

a. Given a triangle ABC:
a1. there is constructed a parallel CD to the line AB, thus:



a2. But this construction:
a2a. IS NOT YET THE DEMONSTRATION, - as Goblot thinks it is -
a2b. BUT IS ONLY THE DETERMINATION OF THE MEDIUM OF DEMONSTRATION.

b. But the demonstration proceeds thus:-

'The sum of the angles of the triangle ABC is equal to the sum of the angles at the point C.
But the sum of the angles at the point C is equal to two right-angles.
Therefore the sum of the angles of the triangle ABC is equal to two right-angles.'

463. THIS IS A SYLLOGISM PROPERLY SO-CALLED: NOR LET IT BE THOUGHT that the fore-going syllogism is a merely expository syllogism or syllogism only improperly so-called (cf. nn.298-299), on the ground that its M is singular:

A. For:
a. Only apparently is the M singular,
b. for in reality the above DEMONSTRATION is UNIVERSAL as regards all its propositions: for:
b1. it is not a demonstration about the triangle in the figure drawn,
b2. but is about every triangle. For:
b2a. it proves from the nature of triangle that it have the sum of its angles equal to two right-angles,
b2b. and the figure drawn serves to no other purpose than to sustain by way of a sensible instrument the reasoning itself.

B. This therefore is the sense of the above-indicated demonstration:

'The sum of the three angles of a triangle is equal to the sum of the angles constituted from one angle of the triangle and two others which result from the protraction of one side of this angle and from the parallel of the side of the triangle subtending this angle and from the other side of the same angle.
But this sum is equal to two right-angles.
Therefore the sum of the three angles of a triangle is equal to two right-angles.'

C. Therefore:

a. Quite logically - although falsely - Goblot, BY REASON OF HIS NOMINALISM, which can consider nothing beyond individuals:
a1. denies that in mathematics there is true deduction.
a2. For, given nominalism, there is had nothing more than a certain exposition of the construction.

b. Hence:
b1. Unjustifiably is Goblot reprehended by Boyer (Cursus Philos. I, pp.288-289):
b1a. who regards that demonstration:
b1a1. as a singular demonstration,
b1a2. to which then MUST BE ADDED AN INDUCTION in order to obtain a universal conclusion.
b2. Which contention is to be utterly rejected.

....

DISSERTATION TWO.

IN MATHEMATICS THERE IS NO ROOM FOR INDUCTION.

464. THIS IS EVIDENT FROM THE NATURE OF MATHEMATICS: That induction can have no place in mathematics is evident:

A. From the very nature of mathematics.

B. For mathematics, of its very nature, abstracts:
a. both from the singular,
b. and from the sensible. (Cf. nn.409, 413).

465. IT IS ALSO EVIDENT FROM CONSIDERATION OF THE PROBLEM OF REASONING BY RECURRENCE: For the rest, that induction has no place in mathematics is evident from the discussion of the problem of reasoning by recurrence.

A. REASONING BY RECURRENCE ACCORDING TO POINCARÉ:

a. According to Poincaré:

a1. mathematical reasoning:
a1a. would be a certain special type of induction,
a1b. but in no way would it be deduction, which Poincaré regards as necessarily sterile.
a2. This special type of induction is reasoning by recurrence (La Science et hypothese, pp.18-20).

b. As an example of what Poincaré calls reasoning by recurrence:
b1. Let us take the demonstration of the theorem:

$$a + 1 = 1 + a.$$

b2. The demonstration is as follows:

'If this is true when $a = y$, it will be true also when $a = y + 1$.
For if $y + 1 = 1 + y$, likewise $(y + 1) + 1 = 1 + (y + 1)$.
For $y + 1 + 1 = 1 + y + 1$.
Moreover when $a = 1$, the theorem is true: for $1 + 1 = 1 + 1$.
Consequently it will be true if $a = 1 + 1 = 2$; likewise if $a = 2 + 1 = 3$; and thus 'ad infinitum'.
Wherefrom it is to be concluded, by the aid of induction or by transition from singulars to universal, that the theorem is true for every number.'

B. WHAT IS TO BE THOUGHT OF THIS REASONING?

a. In reality it is a deduction to which is annexed verification in particular cases:

a1. A DEDUCTION indeed:
a1a. Which is based on the nature of number, which is multitude measured by one (cf. nn.440-441).
a1b. This deduction may be thus explicitly expressed:-

'Since number is multiplicity measured by one, no property can befit together n and n + 1 save through something common, to wit, by reason of the unit which measures n.
But what befits some number by reason of the unit which measures it, befits every number measured by this unit.
Therefore this property befits every number.'

a2. But we say also a VERIFICATION:
a2a. and we call it a verification because it is not able to prove a universal conclusion without the conclusion being illegitimate unless recourse is had to the nature of number;
a2b. and then by that very fact:
a2b1. it is no longer induction,
a2b2. but is true deduction.

b. Falsely indeed, moreover, does Poincaré assert:
b1. that knowledges do not progress by the syllogism;
b2. this assertion - nominalistic - is not true, once the realism of intellect is admitted. (Cf. n.272).

....

DISSERTATION THREE.

MATHEMATICAL DEDUCTION IS OF THE SAME SPECIES AS IN OTHER SCIENCES.

466. REASON OF THIS QUESTION: A doubt arises about the nature of mathematical deduction, on the ground that:

A. It is not a syllogism of inherence (i.e. a syllogism concerned about the in-be of P to S, or, in other words, a syllogism in which S and P are identified);

B. But is a syllogism of relation, to wit, of equality and inequality (i.e. about the equality or inequality of P to S).

467. ANSWER: It must be said that in reality:

A. In these reasonings:
a. The relation is predicated of the subject and is affirmed to be-in it.
b. Thus:
b1. this proposition: 'x = y',
b2. is really this: 'x is equal to y', (Cf. n.66, C).

B. Indeed the principle of mathematical deduction, to wit:

a. 'two which are EQUAL to one same third are EQUAL to each other, and two whereof the one is UNEQUAL to a third while the other is EQUAL to it, are UNEQUAL to each other',

b. is nothing but the coarctation or contraction to the object of the second degree of abstraction of the general principle of deduction, to wit: 'two which are the same to one same third are the same to each other, and two whereof the one is not the same to a third while the other is the same to it, are not the same to each other' (i.e. the PRINCIPLE OF TRIPLE IDENTITY and OF THE SEPARATING THIRD, or simply the PRINCIPLE OF IDENTITY; cf. n.257, A.b).

....

SCHEMATIC SUMMARY.

468. SCHEMATIC SYNOPSIS: The contents of the fore-going article may be thus summarized schematically:-

- Mathematical demonstration
  - IS NOT induction, even when it is reasoning 'by recurrence'.
  - BUT IS deduction
    - Not improperly so-called (singular or expository).
    - But properly so-called (universal)
      - Which is regulated by the supreme principle of the syllogism.
      - Yet as contracted to the object of the second degree of abstraction

....

CHAPTER FORTY-ONE.

....

THE SCIENCES OF NATURE.

....

469. ORDER OF PROCEDURE: This treatment of the sciences of nature:

A. Will deal with:
a. First, scientific facts.
b. Secondly, scientific laws.
c. Thirdly, scientific theories.

B. Hence the following order:-

On the sciences of nature	Scientific facts	Article one.
	Scientific laws	Article two.
	Scientific theories	Article three.

....

ARTICLE ONE.

SCIENTIFIC FACTS.

470. ORDER OF PROCEDURE: This treatment of scientific facts:

A. Will consider:
a. First, the nature of natural sciences.
b. Secondly, the nature of a scientific fact.
c. Thirdly, the determination of a scientific fact.

B. Hence the following order:-

On scientific facts	Nature of natural sciences	Dissertation one.
	Nature of scientific fact	Dissertation two.
	Determination of a scientific fact	Dissertation three.

....

DISSERTATION ONE.

NATURE OF THE SCIENCES OF NATURE.

471. WHAT ARE THE SCIENCES OF NATURE: By the name 'sciences of nature' are to be understood the sciences of SENSIBLE being, through its extrinsic and observable signs. (Cf. n.412).

472. TWOFOLD GENUS OF SCIENCES OF NATURE: These natural sciences are of two genera, to wit:

A. Sciences of inorganic nature, such as physics, chemistry etc.

B. Sciences of organic nature, such as the biological sciences.

473. THESE SCIENCES PROCEED 'A POSTERIORI': Regarding these sciences:

A. It is evident from their observable object that they proceed:
a. not 'a priori': since neither the natures nor the (philosophical) properties of sensible things are known:
a1. directly in themselves,
a2. but only INDIRECTLY through extrinsic signs.
b. but 'A POSTERIORI':
b1. from the observation of facts and experimentation about facts,
b2. by means of which facts, through induction, they seek, verify, explain and co-ordinate laws.

B. For that reason, before all else, the nature of scientific facts must be explained.

....

DISSERTATION TWO.

NATURE OF SCIENTIFIC FACT.

474. DIVERSE CONCEPTIONS OF SCIENTIFIC FACT: Regarding the nature of scientific fact two opposite extreme conceptions are had:

A. According to EMPIRICISTS and POSITIVISTS a scientific fact is a certain external datum in its physical reality as it is passively received by the intellect.

B. According to IDEALISTS, on the contrary:
a. It is a certain CREATION of intellect or of intuition (thus speaks Le Roy).
b. Therefore it has only a SYMBOLIC value.
c. Similarly, basing their conception on the same principles, the 'sociological school' of Durkheim regard a fact as a certain CONSTRUCTION of the mind.

475. TRUE CONCEPTION: But it must be said that IN REALITY:

A. A FACT is A CERTAIN EXTERNAL REALITY, ACCORDING AS IT IS APPREHENDED BY THE INTELLECT, WHEREOF EXISTENCE IS AFFIRMED.

B. Hence these three are found in every fact, to wit:
a. The object of some sensation;
b. The object of some intellective apprehension, which discerns the datum of the sensation, without deforming it;
c. The object of a judgment of existence.

C. Fact is of threefold genus, to wit: VULGAR fact, SCIENTIFIC fact, and PHILOSOPHIC fact: each is specified by the object of apprehension.

a. For the specification of fact cannot result from the sensation or from the judgment of existence: for these are common to every fact.

b. Therefore:
b1. A VULGAR FACT is specified by a certain apprehension of COMMON SENSE, or, in other words, by a confused apprehension of the intellect (infra-scientific apprehension).
b2. A SCIENTIFIC FACT is specified by a SCIENTIFIC observation, to wit, by apprehension of the first degree of abstraction, according however as this resolves its concepts with reference to the observable (i.e. relatively to sensible being).
b3. A PHILOSOPHIC FACT is specified by a certain PHILOSOPHIC apprehension, of the first or third degree of abstraction, but, if of the first degree, according as it resolves its concepts with reference to sensible being.

c. Therefore:
c1. just as neither can natural philosophy be based:
c1a. on scientific facts,
c1b. but can be based on philosophic facts only;
c2. so neither are the sciences of nature based;
c2a. on any sort of fact at all at random,
c2b. but on scientific facts. (Cf. Yves Simon: Les preoccupations experimentales et les faits philosophiques, Revue de Philos. mai-juin, 1932, pp.273ss; G.Rabeau: Realite et Relativite, pp.139ss; Maritain: Les Degres du savoir, pp.102ss).

D. Further, among scientific facts, a MORAL fact is specified by the concept of a moral being, i.e. of a being which is defined relatively to the end towards which a free agent is ordered. For which reason:

a. It is impossible to know what is a moral being, unless there be knowledge of its value for the free agent. For value is taken from end.

b. This notion is of the highest importance for determining the nature of sociology.

……

DISSERTATION THREE.

DETERMINATION OF A SCIENTIFIC FACT.

476. OFFICE OF EXPERIENCE IN THE SCIENTIFIC FACT: A scientific fact:

A. As it is something singular, is obtained by experience, whether sensitive (external or internal) or intellective (for psychic facts).

B. But as it is specifically distinguished from a vulgar fact, it is obtained:
a. not by any experience at random,
b. but by scientific experience.

C. But as it differs from a philosophic fact:
a. wherefrom it differs inasmuch as it considers being as observable, this experience:
a1. has not a merely material office,
a2. but plays a FORMAL role; for the very concept which specifies a scientific fact:
a2a. does not transcend experience,
a2b. but is of the very observable itself.
b. Wherefore this experience is of the highest importance.

477. TWOFOLD SCIENTIFIC EXPERIENCE: This experience is twofold, to wit: scientific observation and experimentation.

A. SCIENTIFIC OBSERVATION is an ATTENTIVE AND DILIGENT PERCEPTION BY THE INTELLECT OF PHENOMENA WHICH OCCUR IN NATURE OR IN THE VERY SUBJECT ITSELF.

a. Observe that:
a1. Observation of the phenomena of nature, which is called external observation, has place in the physical, chemical, biological and psychological sciences.
a2. But observation of the phenomena which occur in the subject itself, which is called internal observation or introspection, is found in the psychological sciences alone.

b. Note also that:
b1. External observation is conducted by the medium of the external senses and sensitive consciousness ('sensus communis');
b2. But internal observation is conducted by the intellect.

c. Both external and internal observation are aided by instruments, of which:
c1. "Some extend the ambit of some sense; v.g. optical instruments.
c2. "Others introduce into the object itself something which renders observation possible; v.g. Atwood, by retarding the fall of heavy bodies, subjected the phenomenon to measurement.
c3. "Others substitute for some sensation which is impossible, another which is possible, of another kind, but connected with the former; v.g. differences of heat, too small to be perceived by touch, are seen in a galvanometer.

c4. "Others record phenomena, in the absence of the observer; v.g. continuous barometric or thermometric variations, etc." (Geny: Critica, p.343).

d. As regards the PROPERTIES of scientific observation, it must be:

d1. Complete, to wit, omitting no circumstance useful for the determination of the fact: to which a great contribution is made by a certain sagacity of intellect.

d2. Veridic or without prejudice, or, to use Bacon's phrase, "with the simplicity of a child".

d3. Exact, especially where it is question of measurement: for which are required both healthy senses, and perfect instruments, and a certain practical skill.

d4. Methodic, i.e. conducted according to the order which corresponds to the end pursued. For which great value is possessed by patience and fortitude (this latter, especially because in many observations danger is not lacking, v.g. when poisons, electricity etc, must be used).

B. EXPERIMENTATION is A CERTAIN METHODIC OBSERVATION OF SOME PHENOMENA PROVOKED WITH A 'DIRECTIVE IDEA' BY THE EXPERIMENTER OR AWAITED BY HIM IN DETERMINATE CIRCUMSTANCES.

a. It has a twofold office, to wit:
a1. that of determining facts,
a2. and that of verifying hypotheses in the inquisition of laws.
b. Its properties:
b1. are the same as those of observation (A.d),
b2. but it also supposes a certain inventive wit or ingenuity.
c. The determination of the methods of experimentation in the diverse sciences pertains to the respective sciences.

....

ARTICLE TWO.

SCIENTIFIC LAWS.

478. ORDER OF PROCEDURE: This treatment of scientific laws:

A. Will consider:
a. First, the nature of scientific laws.
b. Secondly, the determination of scientific laws.
c. Thirdly, scientific conclusions.

B. Hence the following order:-

On scientific laws:	Their nature	Dissertation one.
	Their determination	Dissertation two.
	Scientific conclusions	Dissertation three.

....

DISSERTATION ONE.

NATURE OF SCIENTIFIC LAWS.

479. DIVERSE OPINIONS: Regarding the nature of scientific laws there is the same diversity of opinions as regarding the nature of a fact (cf. n.474).

A. Some, to wit, MECHANICISTS and ENERGETISTS, although differing on many points, yet imbued with an empiricist or positivist philosophy,

a. hold that laws are:
al. nothing else than a generalization of empiric facts (thus, v.g. says Berthelot),
a2. or equations between the measurable elements (a, b. c) of empiric phenomena (thus, v.g. says Mach.)
b. Briefly, according to them: a scientific law is a merely empiric relation between phenomena.

B. Others, on the contrary, to wit, IDEALISTS:
a. hold that scientific laws, like scientific facts, are merely symbolic constructions of the mind.
b. Thus, for example, says Le Roy, who writes: "Every law, far from our being able to declare it an element extracted from things, appears as a construction of the mind, a symbol and product of our aptitude to vary endlessly the angles under which we regard the constancy in the world...... ...A scientific law is not a total, a resultant or an extract from facts, but a symbolic construction erected on the occasion of these." (Science et philosophie, Rev. Metaph. et Mor., 1899, pp.518-526).

480. TRUE CONCEPTION: But, according to MODERATE REALISM, IT MUST BE SAID that a SCIENTIFIC LAW is indeed a RELATION (NOT BETWEEN PHENOMENA, BUT) BETWEEN SCIENTIFIC FACTS. Therefore:

A. Accordingly:
a. Since facts:
al. are not purely empiric phenomena,
a2. but express, through observable phenomena, some occult or undisclosed essence (for the intellect, whose apprehension specifies the fact, is concerned only about essences, which it attains at least in extrinsic, observable signs),
b. this relation between phenomena:
bl. is not merely empirical,
b2. but is ontological, based in essences;
c. and thus SCIENTIFIC LAW CAN BE DEFINED: ESSENTIAL RELATION BETWEEN SCIENTIFIC FACTS.

B. But this relation:
a. inasmuch as it is essential,
b. is:
bl. necessary,
b2. and therefore universal.

481.TWOFOLD SCIENTIFIC LAW: Scientific law is twofold, to wit, DESCRIPTIVE and CAUSAL.

A. A descriptive law, which already is essential, is:
a. Either QUALITATIVE, v.g. 'A decoction from heliotrope becomes red if acetic acid be added to it.'
b. Or QUANTITATIVE, v.g. the law of refraction of light.

B. A causal law, which expresses:
a. not indeed the cause of a fact, that is, the activity which by its actions produces it - for, in the natural sciences the intellect must remain the order of the observable, i.e. in the order of the sensible and of the imaginable - ,
b. but THE NECESSARY CONDITIONS OF ITS APPARITION. (Cf. Maritain: Les degres du savoir, pp.286-302; Eng. Trans. pp.178-188).
c. For it is to be considered that:
cl. the concept of 'cause' as it is employed in the sciences of nature, is like other concepts, resolved:
cla. not ontologically, as is the philosophical concept of 'cause',
clb. but empiriologically, so that in the lexicon of the natural sciences, 'cause' is nothing else than THE OBSERVED CONDITIONS NECESSARY FOR THE APPARITION OF A FACT, or, in other words, THE CONDITIONS, WHICH WHEN OBSERVED, A FACT CAN BE PREDICTED.
c2. On account of which merely empirical notion of 'cause', without any indirect reference to being, contemporary scientists are logically obliged:

c2a. to substitute for the necessity of these conditions, the probability of them,

c2b. particularly on account of the impossibility, through mechanical laws, of accounting for, and predicting, the movements of a particle (v.g. electron) in a manner at each instant entirely defined; and thus have contemporary scientists, such as Heisenberg:

c2b1. arrived at "the principle of indeterminacy" or "relations of incertitude",

c2b2. and spoken of a series of waves as "a bundle of probabilities".

……

DISSERTATION TWO.

DETERMINATION OF SCIENTIFIC LAWS.

482. SCIENTIFIC LAWS ARE DETERMINED BY INDUCTION: Though more particular scientific laws can be deduced from more general scientific laws, as said above (n.378):.

A. Nevertheless scientific laws do not arise from facts by deduction.

a. For facts imply only the existence of the fact without telling its nature.

b. But the necessary conditions of a fact cannot be known by deduction, unless its nature be known.

B. Therefore only by induction can scientific laws be determined.

483. PREPARATION OF INDUCTION: The nature of induction has been dealt with above (nn.301-312).

A. But it is question here of the PREPARATION of induction.

B. Which preparation is twofold, to wit:

a. HYPOTHESIS, which will be treated first (n.484).

b. METHODS OF INDUCTION, which will be treated of next (n.485).

484. HYPOTHESIS: Since the natural sciences draw their laws from facts by induction, hypothesis, which pertains to the preparation of induction, plays a very great, and necessary, part in the processes of these sciences.

A. An HYPOTHESIS is a PROVISIONAL EXPLANATION OF FACTS.

a. Compared with scientific law:

a1. it agrees in this, that it is an explanation of facts.

a2. but it differs insofar as it is only provisional, i.e. assumed until either verified or disproved.

b. Since it is an explanation of facts:

b1. it is not a mere guess, i.e. without foundation in reality,

b2. but is based upon reality, i.e. upon facts, as suggested (not yet proved) by them.

c. Thus Benjamin Franklin:

c1. upon the suggestion of these facts, that lightning:

c1a. gives light as does an electric discharge,

c1b. manifests the same colour as an electric discharge,

c1c. proceeds in an irregular direction as does an electric discharge,

c1d. proceeds by swift movement as does electric discharge,

c1e. is conducted by metals as is an electric discharge,

c1f. explodes with a crackling noise as does electric discharge,

c1g. is maintained in water or ice as is an electric discharge,

c1h. results in the splitting of bodies as does an electric discharge,

c1i. kills animals as does an electric discharge, c1j. fuses metals as does an electric discharge,

c1k. ignites inflammable matter with an accompanying sulphurous smell as does an electric discharge;

c2. formed the hypothesis that lightning is an electric discharge.

c3. Which hypothesis he proceeded to verify or prove by the aid of his 'kite experiment'.

B. The OFFICE of hypothesis is twofold:

a. To ORDER or reduce to a unity of order the known facts: thus the hypothesis of the vibration of ether orders luminous phenomena.

b. To DIRECT the experiments whereby the true explanation of the facts is sought; in other words, it is the "directive idea" of experiment (cf. n.477, B): thus, in the example given above, the hypothesis that lightning is an electric discharge directed the 'kite experiment' of Benjamin Franklin.

C. The PROPERTIES or CONDITIONS of a good hypothesis:

a. are these:

a1. It must:

a1a. contradict no truth;

a1b. though, since an hypothesis which explains many facts is rarely totally false, at least some part agreeing generically or analogically with the true explanation, it may still be used in spite of its known falsity as a "working hypothesis"; thus, if the vibratory hypothesis regarding light were proved to be false, still, because in the true explanation there would be some cause in a similar fashion periodic, scientists may continue to use that vibratory hypothesis.

a2. It must well order the known facts, i.e. leave none of them without at least possible explanation.

a3. It must be capable of verification i.e. capable of being proved or disproved.

a4. It must be simple and applicable to many cases: for nature is ruled by simple and most universal laws.

b. All these conditions are required by the very nature of scientific law, for the discovery whereof hypothesis prepares.

D. The transition FROM AN HYPOTHESIS TO A LAW is made:

a. NEGATIVELY:

a1. by demonstrating:

a1a. that the hypothesis contradicts no fact;

a1b. that the hypothesis contains no internal contradiction.

a2. But this is not sufficient, for:

a2a. this does not exclude that there be ANOTHER explanation of the same facts;

a2b. or, in other words, this does not show that the hypothesis in question is the SOLE or NECESSARY explanation of the facts;

a2c. or, in other words again, from the false can follow the true 'per accidens' (cf. n.248); that is, given this hypothesis, the known facts may follow owing to some accidental circumstance (v.g. owing to the accidental circumstance that the known facts are only some of the facts and not more): in which case the absence of contradiction with the facts is only 'per accidens', and not 'per se' or necessary.

b. POSITIVELY:

b1. by showing:

b1a. that every OTHER explanation is excluded;

b1b. or, in other words, by showing that the hypothesis in question is the SOLE or NECESSARY explanation of the facts;

b1c. or, in other words again, by showing that this absence of contradiction:

b1c1. is not 'per accidens' (owing to some accidental circumstance),

b1c2. but is 'per se' or necessary (independent of every accidental circumstance).

b2. Which is done by means of the methods of induction which will be dealt with below (n.485).

E. Nevertheless CAUTION must be exercised in the rejection of an hypothesis:

a. For an hypothesis is not to be rejected on the ground that it contradicts some truth, when it contradicts only opinions:

a1. Indeed almost all new hypothesis contradict opinions.

a2. Thus:

a2a. the Copernican hypothesis regarding the movement of the earth contradicted the system of Ptolemy;

a2b. Pasteur's hypothesis regarding the origin of living organisms contradicted the opinion of spontaneous generation.

b. Indeed, as said above (C.a1b), a false hypothesis, if it explains many facts, is only partially false:

b1. wherefore something in it is common with the true explanation;

b2. for which reason it can be useful for the discovery of this true explanation.

F. Hypothesis is distinguished into:

a. WORKING HYPOTHESIS, insofar as its office is (as yet) only to direct investigations.

b. SCIENTIFIC HYPOTHESIS, insofar as its verification or proof is hoped for.

485. METHODS OF INDUCTION: The "methods of induction" are the methods whereby it is shown that the accord of an hypothesis with the facts is 'per se' or necessary, or, in other words, that the hypothesis in question is the true explanation of the facts, as being the sole and necessary explanation.

A. ARISTOTLE already spoke about this.

a. Aristotle's teaching here-upon is thus explained by ST THOMAS:

a1. "From sense is derived a memory.......

a2. "But from a memory effected many times about the same thing, yet in diverse singulars, is derived 'experimentum'; because 'experimentum' seems to be nothing else than to take something from many retained in memory.

a3. "But nevertheless 'experimentum' needs some reasoning about particulars, by which one is compared to another; which is proper to reason. For example, when such a one remembers that such a herb many times cured many of fever, there is said to be 'experimentum' that such herb is curative of fever.

a4. "But reason does not stop at the 'experimentum' of particulars; but from many particulars in which he has had experience, he takes one common, which is set firm in his mind, and he considers it without consideration of any of the singulars; and this he takes as the principle..... ...of science." (In II Post. Anal. lect.20).

b. Note regarding this text:

b1. that:

b1a. although it is concerned with the abstraction of universals, as is clear from the context,

b1b. and not about principles themselves,

b2. nevertheless it already sketches certain delineaments of induction.

B. Now:

a. Sometimes for the discovery of a universal law, one or two observations suffice.

b. But in most cases many facts are to be examined; most often this more diligent observation, aided by experimentation, must be employed:

b1. simple observation indeed, if the fact does not depend on our dispositions (as in astronomy, meteorology, geology etc);

b2. but also experimentation, if the fact can be produced or provoked by us (as in physics and chemistry).

C. Certain RULES are laid down by modern authors for the passage from hypothesis to a universal law:

a. FRANCIS BACON (Novum Organon, II, p.1620):

a1. Requires that three tables be drawn up, to wit:

a1a. A table of positive instances (tabula praesentiae), wherein are to be noted down the cases in which the fact has been observed.

a1b. A table of negative instances (tabula absentiae), wherein are to be noted down the cases in which the fact is not found.

a1c. A table of degrees (tabula comparativa), wherein are to be noted down the variations of the fact in varied circumstances.

a2. But:

a2a. Bacon requires too much, since his demands fall little short of a (formally) complete induction (cf. nn.310-312).

a2b. For which reason Wundt rightly reproaches him. (Cf. Wundt: Logik, II, 1,20).

b. SIR JOHN HERSCHEL (1792-1871) proposed certain rules in his work: 'Preliminary Discourse on the Study of Natural Philosophy', from which John Stewart Mill drew the 'methods' which have become famous under his name.

c. JOHN STEWART MILL (A System of Logic: Bk.III, ch.8-9) proposes the celebrated five methods:

c1. EXPOSITION OF THESE METHODS:

c1a. THE FIRST is the METHOD OF AGREEMENT:

c1a1. Which Mill thus formulates: "If two or more instances of the phenomenon under investigation have only one circumstance in common, the circumstance in which alone all the instances agree, is the cause (or effect) of the given phenomenon." (System of Logic, London, 1941, p.255).

c1a2. Which is:

c1a2a. thus formulated by Mellone: "When observation shows that two events accompany one another (either simultaneously or in succession), it is probable that they are causally connected; and the probability increases with the number and variety of the instances." (Text-book of Logic, ch.9).

c1a2b. and thus briefly stated by Joseph: "Nothing is the cause of a phenomenon in the absence of which it nevertheless occurs." (Logic, p.403).

c1a3. Which is thus illustrated:

c1a3a. By Mill: "For example, let the effect....be crystallization. We compare instances in which bodies are known to assume crystalline form, but which have no other point of agreement; and we find them to have one, and as far as we can observe, only one, antecedent in common: the deposition of a solid matter from a liquid state, either a state of fusion or of solution. We conclude therefore, that the solidification of a substance is an invariable antecedent of its crystallization." (op. cit. p.254).

c1a3b. In other words, more briefly: In every case of crystallization, we find this one common antecedent, namely, transition from a liquid state to a solid state: therefore solidification is the cause of crystallization.

c1b. THE SECOND is the METHOD OF DIFFERENCE:

c1b1. Which Mill thus formulates: "If an instance in which the phenomenon under investigation occurs, and an instance in which it does not occur, have every circumstance in common save one, that one occurring only in the former, the circumstance in which alone the two instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon." (Op. cit. p.256).

c1b2. Which is:

c1b2a. thus formulated by Mellone: "When the addition of an agent is followed by the appearance, or its subtraction by the disappearance, of a certain event, other circumstances remaining the same, that agent is causally connected with the event." (Op.cit.)

c1b2b. and thus briefly stated by Joseph: "Nothing is the cause of a phenomenon in the presence of which it ~~nevertheless~~ fails to occur." (Op.cit. p.404).

c1b3. Which is thus illustrated:

c1b3a. By Mill: "If a bird is taken from a cage, and instantly plunged into carbonic acid gas, the experimentalist may be fully assured (at all events after one or two repetitions) that no circumstance capable of causing suffocation had supervened in the intermim, except the change from immersion in the atmosphere to immersion in carbonic acid gas." (Op.cit. p.256).

clb3b. In other words, more briefly: If an animal which lives in the air, soon dies when immersed in liquid, it may be concluded that air is the necessary cause of its life, and deprivation of air is the cause of its death.

clc. THE THIRD METHOD is the INDIRECT METHOD OF DIFFERENCE:

clc1. Which Mill thus formulates: "If two or more instances in which the phenomenon occurs have only one circumstance in common, while two or more instances in which it does not occur have nothing in common save the absence of that circumstance; the circumstance in which alone the two sets of instances differ, is the effect, or the cause, or an indispensable part of the cause, of the phenomenon." (Op. cit. p.259).

clc2. In which later writers have distinguished two methods, to wit, the double method of agreement and the joint method of difference and agreement:

clc2a. The double method of agreement is thus formulated by Mellone: "Whatever is present in numerous observed instances of the presence of a phenomenon, and absent in numerous observed instances of its absence, is probably causally connected with the phenomenon." (Op. cit. p.306).

clc2b. The joint method of difference and agreement is thus stated by Mellone: "When one phenomenon has been shown to be the cause of another under given conditions, by the method of single difference; and when we fail to find or to construct any instance where the one phenomenon occurs without the other: then it is probable that the first is the 'unconditionally invariable antecedent' of the second - i.e. that the latter can be produced in no other way than by the former; and the probability increases with the number and variety of the negative instances all agreeing in the absence both of the effect and its suspected cause." (Op. cit. p.309).

clc3. Which is thus illustrated:

clc3a. By Mill: "It appears that the instances in which much dew is deposited, which are very various, agree in this, and, so far as we are able to observe, in this only, that they either radiate heat rapidly or conduct it slowly: qualities between which there is no other circumstance of agreement, than that by virtue of either, the body tends to lose heat more rapidly from its surface than it can be restored from within. The instances, on the contrary, in which no dew, or but a small quantity of it, is formed, and which are also extremely various, agree (as far as we can observe) in nothing except in not having this property. We seem therefore to have detected the characteristic difference between the substances on which dew is produced and those on which it is not produced." (Op. cit. pp.273-274).

clc3b. By Bittle: "The 'guinea and feather' experiment can be used to show the Joint Method. According to the laws of gravity all bodies should fall with an equal velocity; but a feather will be slower in reaching the ground than the coin. The hypothesis is formed that the resistance of the air upon the larger surface of the feather is the cause of its slowness. Placing both coin and feather in a tube filled with air, we observe that the fall of both is unequal in velocity; and this repeats itself as often as the experiment is made. So far we have the Method of Agreement. Next we exhaust the air from the tube, and now both reach the bottom at the same moment; this also happens as often as the experiment is repeated. And the same is true of other gases. In all these cases it is the presence of the air (or other gases) which causes the difference of velocity, and the only recognizable reason would appear to be the resistance exerted upon the larger surface of the feather. Hence by the Joint Method we conclude that the resistance of the gas is the cause of this phenomenon of the difference in velocity between the guinea and the feather." (Bittle: The Science of Correct Thinking, pp. 310-311).

cld. THE FOURTH METHOD is the METHOD OF RESIDUES:

cld1. Which Mill thus formulates: "Subduct from any phenomenon such part as is known by previous inductions to be the effect of certain antecedents, and the residue of the phenomenon is the effect of the remaining antecedents." (Op. cit. p.260).

cld2. Which is:

cld2a. thus formulated by Mellone: "When any part of a complex phenomenon is still unexplained by the causes which have been assigned, a further cause for this remainder must be sought." (Op. cit. p.315).

cld2b. and thus briefly stated by Joseph: "Nothing is the cause of one phenomenon which is known to be the cause of a different phenomenon." (Op.cit. p.404).

cld3. Which is thus illustrated:

cld3a. By Jevons: "There cannot be a simpler case.......than ascertaining the exact weight of any commodity in a cart, by weighing the cart and load, and then subtracting the tare or weight of the cart alone, which had been previously ascertained." (Elementary Lessons in Logic, p.252).

cld3b. By Mill, quoting from Sir John Herschel: "M.Arago, having suspended a magnetic needle by a silk thread, and set it in vibration, observed that it came much sooner to a state of rest when suspended over a plate of copper, than when no such plate was beneath it. Now, in both cases, there were two 'verae causae' (antecedents known to exist) why it should come at length to rest, viz. the resistance of the air, which opposes, and at length destroys, all motions performed in it; and the want of perfect mobility in the silk thread. But the effect of these causes being exactly known by the observation made in the absence of the copper, and being thus allowed for and subducted, a residual phenomenon appeared, in the fact that a retarding influence was exerted by the copper itself; and this fact, once ascertained, speedily led to the knowledge of an entirely new and unexpected class of relations." (Op. cit. p.280).

cle. THE FIFTH METHOD is the METHOD OF CONCOMITANT VARIATIONS:

clel. Which Mill thus formulates: "Whatever phenomenon varies in any manner whenever another phenomenon varies in some particular manner, is either a cause or an effect of that phenomenon, or is connected with it through some fact of causation." (Op. cit. p.263).

cle2. Which is:

cle2a. thus formulated by Mellone: "If two phenomena always vary together, other circumstances remaining the same or varying independently, there is probably a causal connection between the two phenomena." (Op. cit. p.312).

cle2b. and thus briefly stated by Joseph: "Nothing is the cause of a phenomenon which varies when it is constant, or is constant when it varies, or varies in no proportionate manner with it.' (Op. cit. p.404).

cle3. Which is thus illustrated by Mill:

cle3a. "When we find that all the variations in the position of the moon are followed by corresponding variations in the time and place of high water, the place being always either the part of the earth which is nearest to, or that which is most remote from, the moon, we have ample evidence that the moon is, wholly or partially, the cause which determines the tides." (Op. cit. p.262).

cle3b. "That the oscillations of the pendulum are caused by the earth is proved by similar evidence. Those oscillations take place between equidistant points on the two sides of a line, which, being perpendicular to the earth, varies with every variation in the earth's position, either in space or relatively to the object. Speaking accurately, we only know by the method now characterized that all terrestrial bodies tend to the earth, and not to some unknown fixed point lying in the same direction. In every twenty-four hours, by the earth's rotation, the line drawn from the body at right angles to the earth coincides successively with all the radii of a circle, and in the course of six months the place of that circle varies by nearly two hundred millions of miles; yet in all these changes of the earth's position, the line in which bodies tend to fall continues to be directed towards it: which proves that terrestrial gravity is directed to the earth, and not, as was once fancied by some, to a fixed point of space." (ibid.).

c2. CRITIQUE OF THESE METHODS:

c2a. These methods are of great practical value, and the use of them by scientists has been attended with much success. (Cf. Coffey: Logic, pp. 172-201).

c2b. Nevertheless:

c2b1. First:

c2b1a. They do not suffice for obtaining universal laws, unless they be completed by a metaphysical principle, namely: this constant nexus between phenomena is the SIGN of a necessity based in the (occult) NATURE of the things.

c2b1b. In other words, these methods are of no avail for the discovery of a universal law unless the empiricism with which they are vested in Mill, be excluded.

c2b2. Secondly:

c2b2a. These methods consider only this one thing, namely, causal nexus.

c2b2b. But:
c2b2b1. not all laws are causal laws;
c2b2b2. for there are other laws, to wit, descriptive laws (n.481), which are either qualitative or quantitative: which are explained:
c2b2b2a. not by means of a causal nexus,
c2b2b2b. but by necessity.

d. Therefore the process of WUNDT seems better:

d1. Which is thus formulated by WUNDT: (Logik, p.385):
d1a. "Among the circumstances which accompany an event, those are essential conditions:
d1a1. "whereof the elimination removes the event itself,
d1a2. "and whereof the quantitative change produces a quantitative change of the event.
d1b. "This rule indicates two experimental methods, which we may call briefly the methods:
d1b1. "of elimination,
d1b2. "and of gradation."

d2. Wundt:
d2a. although:
d2a1. he neither arrives at a true notion of metaphysics,
d2a2. nor remains with positivism in mere experience,
d2b. nevertheless:
d2b1. remaining attached, along with Kant, to phenomenalism and empiricism - albeit with moderation - ,
d2b2. in his inductive process he perhaps pays too little heed to qualitative changes.

d3. However "Wundt approaches more to the truth taught by the scholastics;
d3a. "indeed, further, his process is the very inductive process of the scholastics more experimentally proposed.
d3b. "But philosophically the same is said: the removal or quantitative change of an event is obtained for this reason, that formally and necessarily there is a certain nexus between the event and the circumstances:
d3b1. "as between cause and effects,
d3b2. "or between a nature and its operation." (Pirotta: Summa Philos. p.133).

486. SOME SCIENTIFIC LAWS ARE DEDUCED: Besides the laws obtained by induction, many scientific laws are obtained from other laws by deduction. (Cf. nn.378, 482).

A. From more universal laws other more particular laws are deduced.

B. Other laws are deduced from a combination of several laws determined by induction.

……………………………………

DISSERTATION THREE.

SCIENTIFIC CONCLUSIONS.

487. SCIENCE MUST DEDUCE CONCLUSIONS: Given that the laws which are the principles of the sciences have been determined, science must from them deduce conclusions, - which contribute much to the progress of science.

488. LAWS OBTAINED BY DEDUCTION ARE CONCLUSIONS: In those laws which are obtained by deduction from other laws (cf. n.486), we have already some scientific conclusions.

489. USE OF CONCLUSIONS GOT BY DEDUCTION TO VERIFY LAWS: But further:

A. By means of deduction:
a. are determined applications of laws, or of hypotheses,
b. which applications:
b1. if they are experimentally verified,
b2. constitute verifications of the laws or hypotheses.

B. Thus:
a. Pascal from the hypothesis of Torricelli about atmospheric pressure and the ascension of water in elevators, deduced that a liquid of greater density and on the summit of a mountain ought to ascend less.
b. And:
b1. these applications made by Pascal being later proved from facts,
b2. the hypothesis of Torricelli was verified.

490. USE OF DEDUCTION TO EXPLAIN FACTS AND LAWS, AND TO PERFECT THE KNOWLEDGE OF THEM: Likewise facts already known, or laws already proved, are explained, or the knowledge of them perfected, by deduction.

A. As regards FACTS indeed: For facts are explained:
a. not only by the discovery of laws,
b. but also by deduction, whereby is shown their connexion with a law already known.

B. But as regards LAWS:

a. For laws already determined by induction, may be confirmed:
a1. if later they are deduced from known laws.
a2. "Thus" writes Taine, "it is a law that reduction of temperature produces dew. One may also establish this law deductively from the laws of Dalton on water-vapour diffused in the air. Dalton proved that the quantity of water which can remain diffused in the air in the state of vapour is limited for each degree of temperature and that the maximum is lower in proportion as the temperature is lower. From this it follows deductively that, if there is in the air as much water as the present temperature allows it to contain, every lowering of temperature will lead to the condensation of a portion of the water-vapour. On the other hand, from the known laws of heat, it follows deductively that the contact of the air with a cold body lowers the temperature of the surrounding layer of air, and consequently forces it to relinquish part of the water which it contains. Finally, from the ordinary laws of gravitation and cohesion, it follows deductively that this water attaches itself to the surface of bodies: which is what constitutes dew.........."

b. More indeed, from this deduction laws are explained:
b1. for before they are deduced:
b1a. their truth indeed is established by virtue of the induction whereby they are gathered from facts,
b1b. without induction however explaining them.
b2. This explanation of them pertains to deduction.

491. DISCOVERY OF NEW FACTS BY DEDUCTION: New facts are discovered by means of deduction. Thus did Galle (in 1846) discover the new planet, Neptune, by means of mathematical deduction from the hypothesis formed by Leverrier regarding the cause of the disturbance in the movements of Uranus: for Leverrier hypothetically explained these disturbances from the attraction of some unknown planet. From this hypothesis Galle by mathematical deduction discovered the mass, movement and position of this planet.

....

ARTICLE THREE.

SCIENTIFIC THEORIES.

492. NOTION OF SCIENTIFIC THEORY: It is to be observed that:

A. The sciences of nature:
a. not only:
a1. determine laws (cf. nn.482-486, 488);
a2. and explain laws (cf. n.490),
a3. and institute applications of laws whereby laws are verified (cf. n.489);
b. but also endeavour to coadunate or unify or systematize diverse laws.

B. But:
a. just as for the determination of laws it makes frequent use of particular hypotheses,
b. so also TO ORDER LAWS IT IS OBLIGED TO MAKE USE OF MORE GENERAL HYPOTHESES,
b1. WHICH ARE CALLED THEORIES.
b2. Such are, for example:
b2a. the atomic theory,
b2b. the reticular theory of crystals,
b2c. the kinetic theory of gases.

493. VALUE OF THESE THEORIES: Hence arises a difficult question: What value have these theories?

A. First indeed, we must consider WHAT OPINION IS HELD BY SCIENTIFIC THEORISTS THEMSELVES, who have professedly treated this question; (cf. Rey, La theorie de la Physique chez les physiciens contemporains):

a. In modern times, until the middle of the nineteenth century:
a1. nearly all scientists admitted the scientific theories:
a1a. "not only have a truly explicative value,
a1b. "but attain and represent almost the whole reality of inorganic bodies;
a2. "after that time, there were some who remained in that persuasion." (Hoenen: Acta primi congressus thomistici, p.62).
a3. However, Duhem seems to admit many exceptions, when, after discussing this question (La theorie physique, pp.54-76), he concludes: "If therefore some very great physicists were able to feel pride in the powerful method which they employed, to the point of exaggerating its reach, if they were capable of believing that their theories uncovered the metaphysical nature of things, many inventors who capture our admiration were more modest and more clear-sighted; they recognized that a physical theory was not an explanation; they saw in it a simplified and ordered representation which grouped laws according to a classification more and more perfect, more and more natural." (ibid. p.76).

b. After the middle of the nineteenth century, scientists greatly restricted the explicative value of theories:
b1. "According to Mach, the value of a theory lies in this, that it spares our intellect too numerous efforts (efforts which, without the help of a theory, would be too numerous): in other words, it 'effects an economy of the intellect'.
b2. "According to Poincaré, a theory:
b2a. "is not true or false,
b2b. "but convenient.
b3. "According to Duhem:
b3a. "it not only brings with it an economy of intellect,
b3b. "but, if it is good and universal, leads to a classification of facts and laws, which he calls natural." (Hoenen: op.cit. p.63).
b4. As is clear, these authors greatly restrict the value of theories,
b4a. without however expressly denying to them all explicative value in attaining reality itself,

b4b. as many disciples ~~and imitators of these masters contend~~.

c. TODAY scientists seem to hold an intermediary position:

c1. For they recognize that a theory:

c1a. does not attain the essence of the real (cf. Meyerson: Le physicien et le reel),

c1b. but is a symbol of the real. (Cf. Eddington: The Nature of the Physical World; The Philosophy of Modern Science).

c2. Thus:

c2a. Meyerson writes: "The scientist of to-day cannot indicate the essence of the real. It is this that primarily distinguishes his attitude from that of his materialist predecessor and, even more, from that of the mediaeval physicist: he does not even claim to attain to the being of the real, which, on the contrary, he sees as enveloped in profound mystery." (Le Physicien et le reel, Le Mois, Juin 1931).

c2b. And Eddington writes:

c2b1. "We have suffered, and we still suffer, from expectations that electrons and quanta must be in some fundamental respects like materials or forces familiar in the workshop - that all we have to do is to imagine the usual kind of thing on an infinitely smaller scale. It must be our aim to avoid such prejudgments which are surely illogical; and since we must cease to employ familiar concepts, symbols have become the only possible alternative ....If, then, only pointer readings or their equivalents are put into the machine of scientific calculation, how can we grind out anything but pointer readings......Whenever we state the properties of a body in terms of physical quantities we are imparting knowledge as to the response of various metrical indicators to its presence and nothing more. After all, knowledge of this kind is fairly comprehensive. A knowledge of the response of all kinds of objects - weighing-machines and other indicators - would determine completely its relation to its environment, leaving only its un-get-atable nature undetermined.......The Victorian physicist felt that he knew just what he was talking about when he used such terms as matter and atoms. Atoms were tiny billiard balls, a crisp statement that was supposed to tell you all about their nature......But now we realise that science has nothing to say as to the intrinsic nature of the atom. It is, like everything else in physics, a schedule of pointer readings......Scientific investigation does not lead to knowledge of the intrinsic nature of things.......The external world of physi has thus become a world of shadows." (The Nature of the Physical World, pp.249, 252, 257, 259, 303, and XVI).

c2b2. "Something unknown is doing we don't know what - that is what our theory amounts to. There is the same indefiniteness as to the nature of the activity and of what it is that is acting. And yet from so unpromising a beginning we really do get somewhere. We bring into order a host of apparentl unrelated phenomena; we make predictions and our predictions come off. The reason - the sole reason - for this progress is that our description is not limited to unknown agents executing unknown activities, but numbers are scattered freely in the descriptions. To contemplate electrons circulating in the atom carries us no further, but by contemplating eight circulating electrons in one atom and seven circulating electrons in another we begin to realise the difference between oxygen and nitrogen. Out of the numbers proceeds the harmony of natural law which it is the aim of science to disclose. We can grasp the tune but not the player." (Ibid. pp.291-292).

B. This last opinion, provided it is rightly understood, is the acceptable opinion.

a. THE FIRST OPINION (i.e. the opinion common before the middle of the nineteenth century) exaggerates the value of theories, not maintaining the specific distinction between the sciences of nature and the philosophy of nature. (Cf. n.412).

a1. For the truth is that natural science does not know essences in themselves:

a1a. for the sciences of nature are directly concerned:

a1a1. with observable reality,

a1a2. not with ontological reality;

a1b. therefore they do not know essences save through empiriological a2. But according to the FIRST opinion:

a2a. theories attain, beyond the observable, "almost the whole reality of inorganic bodies", as said above (A.a).

a2b. Nor is this surprising, if it be considered that this is an opinion either of materialists or of physicists after the manner of the physicists of the Middle Ages.

a2b1. For MATERIALISTS cannot distinguish an empiriological order from an ontological (intelligible) order:

a2b1a. and therefore, when they admit that theories have real value, they must teach that they attain and represent the whole of the real, to wit, observable reality:

a2b1a1. as if the heart of things were directly observable.

a2b1a2. Which clearly is false.

a2b2. THE PHYSICISTS OF THE MIDDLE AGES:

a2b2a. since they did not distinguish between:

a2b2a1. that Physics which is experimental or positive science,

a2b2a2. and that Physics which is a part of natural philosophy,

a2b2b. could not maintain the real value of theories without attributing to them the ability to attain the essences of things in themselves.

a2b2c. Which is likewise to be rejected.

b. But THE SECOND OPINION (i.e. the opinion which was in vogue from the middle of the nineteenth century until recently), at least as it is found in the disciples who seem to exaggerate the mind of those masters (such as Mach, Poincaré and Duhem) in the direction of restricting the value of theories to the point of denying to theories all real value, is likewise to be rejected.

b1. For this opinion supposes that the human intellect has not as its proper formal object the essences of sensible things.

b1a. For this opinion suffers from the vice of Pragmatism and Nominalism:

b1a1. from which vice even those masters themselves:

b1a2. were not completely free,

b1b. although they spoke much more cautiously than their disciples.

b2. But IN REALITY:

b2a. a formal distinction being admitted between:

b2a1. the empiriological explanation of science,

b2a2. and the ontological explanation of natural philosophy,

b2b. it must be said that:

b2b1. whereas natural philosophy attains essences directly and in their ontological properties,

b2b2. natural science attains essences indirectly and obliquely, in their observable external signs only.

c. THEREFORE WHEN SCIENTIFIC THEORISTS OF TODAY TEACH, IN ACCORDANCE WITH THE LAST OPINION (cf. A.c):

c1. That:

c1a. theories do not attain the essence of the real;

c1b. this is true, provided what they say be understood of knowledge of the essence of the ontological reality in itself.

c2. That:

c2a. theories are symbols of reality;

c2b. this also is true, provided the value of these symbols be duly determined.

c2b1. They must not be understood as if they were pure symbols without any foundation in the real: for this understanding would reduce this third opinion to the second opinion.

c2b2. But neither, on the contrary, is it enough to say that theories analogically represent physical reality, as Hoenen says (op.cit. pp.61-74), without any further determination of this term 'analogically'.

c3. It is indeed true that physico-mathematical theories analogically represent reality: but the analogy whereof it is question is to be determined.

c3a. It is not analogy of proper proportionality (cf. 153.H):

c3a1. for this would mean that we know these essences:

c3a1a. not indeed in themselves,
c3a1b. yet nevertheless 'ontologically' (i.e. non-empiriologically): which is impossible, as said above.
c3a2. And therefore theories are rightly said to represent reality symbolically, or, in other words, according to metaphoric analogy (cf. n.153,H).
c3a3. Therefore these theories are mental beings (entia rationis).

c3b. But insofar as a theory does genuinely represent obliquely the 'ontological' reality:
c3b1. it must be assimilated to this reality,
c3b2. and therefore it is mental being with foundation in the real (i.e. based mental being: cf. nn.109-112).

c3c. But as regards the 'empiriological' facts which a theory represents, insofar as they are measurable:
c3c1. the assimilation is univocal,
c3c2. and under this aspect a physico-mathematical theory has the value of real being:
c3c3. which is the foundation of the mental being.

c4. But the empirio-schematic theories of the biological and psychological sciences, which theories are not yet mathematized:
c4a. are not, as are physico-mathematical theories, combinations of real beings and mental beings;
c4b. but are real beings which univocally represent:
c4b1. directly empirological reality,
c4b2. and indirectly ontological reality.

……………………………………………

SCHEMATIC SUMMARY.

494. SCHEMATIC SYNOPSIS: The contents of the fore-going chapter may be thus schematically summarized:-

- On the sciences of nature:
  - On SCIENTIFIC FACTS:
    - Their nature
      - In itself
        - Wrong conceptions
          - The empiricist and positivist conception.
          - The idealist conception.
        - Right conception: that of moderate realism.
      - relatively to
        - vulgar fact.
        - philosophic fact.
    - Their determination
      - by experience
        - by observation.
        - by experimentation.
      - by deduction.
  - On their LAWS:
    - On the determination of them:
      - On the discovery of them:
        - Nature of scientific law.
        - Two manners of discovery:
          - Induction, whose preparation is made by
            - Hypotheses.
            - Methods of induction
              - Of Bacon and Mill.
              - Of Wundt.
          - Deduction.
      - On the proving of them: They are verified by deduction.
    - On the co-ordination of them, or on theories:
      - Their nature.
      - Their value:
        - They express the essence of the real.
        - Yet not in itself, but
          - In empiriological signs:
            - Thus the theories of the biological sciences,
            - Which are therefore real beings.
          - In symbols:
            - Thus physico-mathematical theories,
            - Which therefore are mental beings based in the real.

……

CHAPTER FORTY-TWO.

……

MORAL SCIENCE.

……

495. ORDER OF PROCEDURE: This treatment of moral science will consider two questions:

A. To wit:
a. First, whether in the present state of men merely philosophical natural science is true practical science.
b. Secondly, whether in the present state of men, there is philosophical moral science.

B. Hence the following order:-

On moral science:
- Whether now moral philosophy is true practical science..Article one.
- Whether now there is philosophical moral science........Article two.

……

ARTICLE ONE.

WHETHER NOW MORAL PHILOSOPHY IS TRUE PRACTICAL SCIENCE.

496. CONCLUSION: Here:

A. It is question:
a. of practical science (cf. nn.396-401),
b. not of speculative science about operables (cf. n.399).

B. And the conclusion is this: IN THE PRESENT STATE OF MEN, MERELY PHILOSOPHICAL MORAL SCIENCE CANNOT CONSTITUTE TRUE PRACTICAL SCIENCE.

497. PROOF OF THIS CONCLUSION: Moral science:

A. Is true practical science, inasmuch as it is concerned:
a. not about good things,
b. but about good use of liberty by the operant.

B. Therefore moral science which is true practical science can abstract:
a. Neither from the ultimate end of man's life, which in the present state of men is a supernatural end;
b. Nor from the concrete conditions in which man now exists.

C. Therefore a merely philosophical moral science:
a. which:
a1. has regard only to a natural ultimate end,
a2. and considers another state of existence, to wit, the state of pure nature,
b. cannot constitute:
b1. true practical science,
b2. but only a speculative science about operables.

498. THIS DOES NOT EXCLUDE THE POSSIBILITY OF MERELY PHILOSOPHIC MORAL SCIENCE: However, the above conclusion standing:

A. It does not follow that a merely philosophical moral science has no place in the present state of men.

B. But this merely philosophical moral science, or natural ethics, is not to be rejected provided:

a. it be not considered:

a1. either as constituted IN THE DEGREE OF TRUE PRACTICAL SCIENCE,

a2. or as independent of the moral science which orders human acts relatively to their supernatural ultimate end;

b. but be considered only as a certain part essentially incomplete of true practical science. (Maritain: La Philosophie Chretienne, pp.102-108; Science et Sagesse, pp.268, 278ss).

……………………………………

ARTICLE TWO.

WHETHER NOW THERE IS PHILOSOPHICAL MORAL SCIENCE.

499. OPINIONS: This is a much disputed question, even among Thomists.

A. Some, such as Deman (Revue des Sciences Philos., 1934, pp.258-290), and Ramirez (Bulletin Thomiste, avril-juin, 1935), deny this thesis, to wit, THAT THERE EXISTS IN THE PRESENT STATE OF MEN, A MORAL PHILOSOPHY CONSTITUTED IN THE STATE OF SCIENCE, SPECIFICALLY DISTINCT FROM MORAL THEOLOGY, PROVIDED THIS PHILOSOPHY BE CONSIDERED AS SUBALTERNATE TO SACRED THEOLOGY. (Cf. n.425).

B. But others, on the contrary, such as Maritain (De la Philosophie Chretienne; Science et Sagesse) affirm this thesis, and rightly so.

500. PROOF OF THIS THESIS: This thesis is to be maintained, and the proof of it is reduced to the following:

A. ARGUMENT:

a. It remains to natural wisdom, in the present state of men, to treat of those things whereof theological wisdom cannot treat.

b. But theological wisdom cannot treat of the HUMAN OPERABLE (DO-ABLE) FORMALLY AS HUMAN.

c. Therefore besides theology, there is to be admitted a certain moral philosophy, which, however, on account of what has been said above (nn.496-497), is subordinated to sacred theology.

B. Of this argument:

a. The MAJOR is evident from this:

a1. that grace does not destroy, but perfects, nature.

a2. But something natural would be destroyed, if, on account of the elevation of human nature to a supernatural end, something about which sacred theology cannot treat, were prohibited to natural wisdom.

b. The MINOR is proved from the diverse formal objects (formal reasons whereunder: cf. nn.403-406) both of sacred theology and of moral philosophy.

b1. For the formal reason whereunder sacred theology proceeds is the light of divine revelation: for everything which sacred theology considers is considered by it inasmuch as it is divinely revealable.

b2. But the formal reason whereunder moral philosophy proceeds is the orderability of human actions by practical reason.

c. IF IT BE OBJECTED:

c1. That, on account of the elevation of practical reason by the light of divine revelation, the formal reason whereunder of natural moral science (ethics) is identified with the formal reason whereunder of sacred theology.

c2. THE ANSWER IS that there is a twofold elevation of reason by the light of divine revelation:

c2a. The one:
c2a1. is such that human reason becomes an instrumental cause ('instrumental' in the strict sense) of the divine light;
c2a2. and this is the elevation of reason as it is found in sacred theology.

c2b. But the other is such that human reason remains a principal cause, although dependent on a higher cause.

c2b1. For it is to be borne in mind that "many causes operate some effects beyond their own power through power participated from another, and yet they are principal causes;
c2b1a. "just as it is clear that heated water and heated iron produce heat, and the moon, being illuminated, produces light, in participating it from the sun, and yet they are principal causes, because the effects, which they produce univocally, are assimilated to the power received, whereby they produce them, viz. to heat and to light.
c2b1b. "Similarly a vital power, as an intellect illuminated by the light of glory, or of grace, produces supernatural acts, which exceed its own proper power, and yet produces them as a principal cause:
c2b1b1. "both because those acts do not exceed the superadded power, wherefrom they proceed, being supernatural, like the power itself, and they only differ as initial act and terminal act: which does not suffice for the character of instrument; otherwise to all natural acts, a power and habit would have themselves instrumentally.
c2b1b2. "And also, because those acts are vital; therefore they proceed from a principle moving itself, therefore not merely instrumentally moved and subserving another, but as from a principal cause. For, that which moves itself, by this very fact moves and operates from power which it has in itself, and does not minister to another, but to itself, and does not wait to be moved by another, but begins from itself, because it moves itself. But these are the conditions of a principal cause, to wit, that it be a cause from which movement begins primarily and necessarily, and which does not subserve and minister to another, but to itself." (John of St. Thomas: Cursus Phil. t. II, ed. Reiser, p. 515 b; Cursus Theol., t. VII, disp. 2, a. 1, n. 23; cf. Maritain: Science et Sagesse, pp. 311ss:)

c2b2. Therefore:
c2b2a. Besides the former elevation of practical reason which pertains to sacred theology,
c2b2b. there must remain the latter elevation under the light of revelation: for otherwise the exercise of principal causality, which practical reason would have in man existing in the state of pure nature, would:
c2b2b1. far from being perfected,
c2b2b2. be destroyed.
c2b2c. Which elevation remaining:
c2b2c1; there remains:
c2b2c1a. distinct from the formal reason whereunder of sacred theology,
c2b2c1b; the formal character whereunder of moral philosophy:
c2b2c2. yet more perfect from the elevation of practical reason by the light of divine revelation, that is, from the subalternation of this moral philosophy to sacred theology.

501. FORMAL OBJECT WHICH OF MORAL PHILOSOPHY SUBALTERNATE TO THEOLOGY: It FOLLOWS FROM WHAT HAS BEEN SAID:

A. That moral philosophy subalternate to sacred theology has as its formal object which (or formal character which) human acts ordered indeed:
a. ULTIMATELY to the supernatural and eternal end,
b. but PROXIMATELY to temporal ends, and to temporal works, el-
indeed, not abolished, from their ordination to the supernatural ultimate end.
B. For:

a1. not from their ultimate end,
a2. but from their "PROXIMATE END", as John of St Thomas says (Cursus Theol., t.VI, disp.16, a.7, n.30).
b. But from the elevation of man to a supernatural end:
b1. temporal ends remain nevertheless:
b1a. non-ultimate ends,
b1b. and are not pure means;
b2. (for:
b2a. the specification of a means is from the end,
b2b. but a non-ultimate end is specified from itself, yet from itself as subordinated to the ultimate end).

C. This formal object which of moral philosophy distinct from the formal object which of sacred theology is already touched by BANNEZ when he writes:
a. "To moral philosophy it properly and directly pertains to define questions of right and justice insofar as man is ordered to political intercourse and a natural end.
b. "But to sacred theology it in the highest way pertains to scrutinize about right even down to the smallest details with respect to spiritual good and the supernatural end. And after this manner, sacred theology, since it is practical, at least eminently considers all things which the moral philosopher considers, with much greater altitude and much more divinely than he." (Bannez: De Iure et Iustitia, Prooemium).

D. ST THOMAS analogically touches the same when speaking of superior and inferior reason, and of the acquired and infused virtues:

a. Where he is speaking:
a1. of superior and inferior reason:
a1a. "Inferior reason takes counsel, tending to election, from reasons of temporal things, as that something is superfluous or falling short, useful or fitting, and so of other conditions which the moral philosopher treats;
a1b. "but superior reason takes counsel from eternal and divine reasons, as because it is against the precept of God or engenders an offence of him, or something of this kind." (In II Sent. disp.24, q.2, a.2).
a2. "For example, synderesis proposes this: every evil is to be avoided;
a2a. "superior reason assumes this: adultery is evil, because prohibited by the law of God;
a2b. "or inferior would assume this, that it is evil, because unjust, or unfitting." (Ibid. a.4).

b. Where he is speaking of the acquired and infused virtues:
b1. "The acquired virtues, of which the philosophers have spoken, are ordered only to perfect men in civil life........
b2. "The civil good:
b2a. "is not the ultimate end of the infused cardinal virtues...........
b2b. "but of the acquired virtues, of which the philosophers have spoken." (QQ. Disp., De Virt. Card., a.1, c. et ad 3).

502. CONCLUSION: Therefore the conclusion must be that:

A. JUST AS human acts are referred in two ways (and in these ways, either implicitly or explicitly):

a. In the spiritual (supernatural) line, by means of the infused virtues, directly to the good of eternal life and of the supernatural ultimate end;

b. In the temporal line, by means of the natural virtues elevated by infused virtues;
b1. directly to the good of civil life,
b2. and indirectly to the supernatural ultimate end.

B. SO human acts:

a. In the spiritual (supernatural) line, through sacred theology, are directly ordered to the good of eternal life and of the supernatural ultimate end, under the light of revelation, using reason as a merely instrumental cause:

b. In the temporal line, through moral philosophy, subalternate to sacred theology:

b1. directly to the good of civil life, under the light of reason as a principal agent, yet elevated by the light of theology (the light of revelation).

b2. whereby they are indirectly referred to the supernatural ultimate end.

……………………………………

SCHEMATIC SUMMARY.

503. SCHEMATIC SYNOPSIS: The contents of the fore-going chapter may be thus schematically summarized:-

Philosophical moral science
- INDEPENDENT or merely philosophical
  - Is not had in the present state of men in the grade of true practical science.
  - Yet is had, as an incomplete part of true practical science.
- SUBALTERNATE TO SACRED THEOLOGY, is had
  - NOT so however that it would become a PART of sacred theology.
  - But remaining SPECIFICALLY distinct from it, inasmuch as it is specified
    - ULTIMATELY indeed from the supernatural end.
    - But IMMEDIATELY from a temporal end which it considers
      - NOT directly under the light of revelation.
      - BUT directly under the light of practical reason:
        - Not as an instrument of the light of revelation.
        - But as a principal cause under the elevation of supernatural revelation.

……………………………………

CHAPTER FORTY-THREE.

……………

SOCIOLOGY.

……

504. ORDER OF PROCEDURE: This treatment of sociology:

A. Will consider:

a. First, the object of sociology.

b. Secondly, the nature of sociology.

B. Hence the following order:-

On sociology
- Its object....................................Article one.
- Its nature....................................Article two.

……

ARTICLE ONE.

OBJECT OF SOCIOLOGY.

505. NOTION OF SOCIOLOGY: All admit that sociology is:

A. The science of social facts;

B. Or the SCIENCE WHICH IS CONCERNED ABOUT FACTS WHICH RESULT FROM THE COLLECTIVE LIFE OF MEN.

506. NATURE OF SOCIAL FACTS: But it must now be determined which is the nature of social facts:

A. According to DURKHEIM, LEVY-BRUHL and generally the 'SOCIOLOGICAL SCHOOL', a social fact arises from the collective soul of society, which is diverse from the individuals who constitute society. Therefore a social fact is:

a. Not material save in regard to expression, but spiritual (psychic).

b. Collective (proceeding from the collective consciousness),
b1. and therefore is diverse from an individual psychic fact.
[illegible] Thus:
[illegible] Durkheim writes: "In binding themselves together, in penetrating each other, in entering into fusion, individual souls give birth to a psychic being, if one wishes so to call it, but which constitutes a psychic individuality of a new kind." (Regles de la methode Sociologique, p.127).
b2b. Though Tarde (1843-1904) contradicts Durkheim, teaching that a social fact is an inter-individual psychological fact proceeding from imitation.

c. Extrinsic to individual consciousnesses:
c1. since it proceeds from the collective consciousness,
c2. which is extrinsic to individual consciousnesses.

d. Coercive: whereby are explained:
d1. both the social necessities of life,
d2. and the rules of law (juridic rules).

B. This notion of social fact proceeds from an erroneous doctrine regarding the nature of society: according to Durkheim, society is a real being beyond the individuals, (although Durkheim often affirms the contrary).

a. But IN REALITY IT IS TO BE SAID, along with St Thomas, that society, beyond men, is only mental being.
a1. For it is a union of men for the doing or obtaining of something common.
a2. Therefore society has reality, from this, that the men who constitute it, tend together for a common end or for a common good.

b. Therefore a social fact:
b1. diverse indeed from an individual fact, is:
b1a. not psychic.
b1b. but moral.
b2. For it arises from the free activity of men for the procuring of a common good.

c. Nor ought it be called collective:
c1. as if it proceeded from a collective consciousness, distinct from the consciousness of individuals,
c2. but inasmuch as it arises from the free action of men ordered towards a common good.

d. And:
d1. therefore:
d1a. neither is it extrinsic to individual consciousnesses:
d1b. nor therefore is it imposing coactions merely from without,
d2. but:
d2a. it is imposing moral obligations arising from the consideration of the exigencies of a good common from within,
d2b. to which exigencies the coercive power of society is subordinate.

C. From what has been said, it already appears in what a social fact differs from psychic, historical, and biological facts.

a. It differs from psychic facts indeed, inasmuch as it is a moral fact:

a1. It is true indeed:
a1a. that not every psychic fact abstracts from freedom,
a1b. but even when it is question of the exercise of freedom:
a1b1. in one way is such exercise considered by the psychologist, who considers in it its manner of proceeding,
a1b2. but in another way is it considered by the moralist, who judges of it according to the rule of morals. (Cf. Yves Simon: Critique de la connaissance morale, p.138, note 1).

a2. Durkheim also:
a2a. distinguishes a social fact from a psychic fact,
a2a1. insofar as the social fact proceeds from the collective consciousness,
a2a2. whereas the psychic fact proceeds from an individual consciousness.
a2b. But this distinction does not avail, unless his doctrine about society be admitted.

b. It differs from historical facts:

b1. Materially indeed historical facts and social facts are the same.

b2. But formally they differ:
b2a. For the same fact is diversely considered by a sociologist and by an historian:
b2a1. For the sociologist operates a certain abstraction about it in order to obtain universal conclusions;
b2a2. whereas the historian considers the singular fact with its circumstances of time and place.
b2b. Thus:
b2b1. The assassination of Julius Caesar by Brutus is an historical fact; but the assassination of him for political reasons is a social fact.
b2b2. The isolation of Napoleon at St Helena is an historical fact; but his exile thither for political reasons is a social fact.

c. It differs from biological facts:

c1. For:
c1a. biological facts are physical, and subjected to determinism:
c1b. but social facts are moral, and free.

c2. Nevertheless there is a certain analogy between them:
c2a. For both rise from an organism:
c2a1. biological facts indeed from a physical organism,
c2a2. but social facts from a moral organism.
c2b. But Herbert Spencer greatly exaggerates this analogy, retaining on account of his empiricism, scarcely any difference between these two organisms.

……………………………………

ARTICLE TWO.

NATURE OF SOCIOLOGY.

507. DURKHEIM'S CONCEPTION OF SOCIOLOGY AS A SPECULATIVE AND 'POSITIVE' SCIENCE: According to Durkheim:

A. Sociology is:
a. an experimental SPECULATIVE science after the manner of experimental psychology or experimental physics.
b. Even further, to this science normative moral science ought to give place.

B. It is readily to be admitted that Durkheim proceeds logically:
a. Admitting indeed no moral obligation beyond social coactions, there is no longer any room for him to admit normative science.
b. And paying no attention to freedom, and therefore to the moral nature of a social fact, he must consider sociology after the manner of the "positive" sciences.

508. CONTROVERSY AMONG SCHOLASTIC PHILOSOPHERS: But even among scholastic philosophers, it is disputed whether sociology is speculative or practical science.

A. All indeed admit that sociology cannot be substituted for normative, or practical, social philosophy.

B. But there are some, such as Delos (L'objet de la Sociologie, in Comment juger la sociologie contemporaine; Precis de Sociologie, Introd.), who think that:
a. besides moral philosophy,
b. sociology is a speculative science "autonomous" from philosophy (cf. n.421).

C. Yet others, such as Yves Simon, Lallement, and Maritain, are of contradictory opinion, asserting that sociology:
a. is only a science connected with moral philosophy,
b. and therefore belongs to the genus of PRACTICAL sciences.

50[illegible] [illegible] OPINION: This last opinion alone seems acceptable:

A. For the object of sociology:
a. is social fact,
b. which, as said above (n.506), is moral fact; and as moral:
b1. cannot abstract from the end wherefrom it is necessarily specified,
b2. and therefore cannot perfectly abstract from normative judgments.

B. For which reason even experimental science cannot be concerned about such a fact in abstracting perfectly from every normative judgment:
a. and therefore cannot constitute speculative science;
b. for such an experimental science, if it is possible, belongs to the GENUS OF NORMATIVE SCIENCE.

C. But the question whether such experimental sciences are possible, is to be answered BY DISTINGUISHING:

a. If the disciplines which, as present-day sociology, are concerned about moral facts, be taken as separate from all teleological consideration, even the most remote, and from all normative judgment, even implicit, they are not sciences save in an utterly improper sense, inasmuch as they use scientific and critical methods for the study of facts:
a1. They only furnish the matter of experimental information, a matter:
a1a. preparatory to normative science,
a1b. and very useful,
a1c. in which moral science will find the matter of philosophic facts (cf. n.475).

a2. And therefore sociology cannot independently of normative moral science constitute an autonomous speculative science.

b. On the contrary sociology continued by moral philosophy (cf. nn.432-433):
b1. is true science,
b2. yet annexed to moral philosophy.

c. Indeed, even further: whether it be taken in the first way as a simple preparation for moral science, or be taken in the second way as a science annexed to moral philosophy, sociology is only apparently speculative; but really pertains to practical knowledge:
c1. If taken in the first way indeed, because then it is only the matter of practical science; and as matter, from itself is ordered towards the constitution of practical science.
c2. But if taken in the second way, because already not abstracting from the end of human actions, such knowledge is 'per se' practical.

d. But in sociology, even when in continuity with moral philosophy, although it is unable to abstract perfectly from normative judgments - because it pertains to practical knowledge - nevertheless it ought voluntarily to leave these normative judgments, as far as is possible, merely implicit and virtual.

d1. Both for the reason that:
d1a. the proper office of the science of sociology is a simple office of experimental information,
d1b. and therefore it ought to leave explicit normative judgments to moral philosophy, with which it is connected.

d2. And for the reason that:
d2a. to man pertains indeed judgment:
d2a1. about human acts considered in themselves,
d2a2. not about men nor about historical events: for these are reserved to the judgment of God.
d2b. But to judge about human acts:
d2b1. pertains to moral philosophy,
d2b2. not to sciences of experimental information, which are concerned about men and historical events.

d3. Nevertheless for a right understanding of social facts:
d3a. there is required in the sociologist a knowledge of moral philosophy,
d3b. because these facts about which sociological enquiry is concerned are moral facts. (Cf. Yves Simon: La critique de la connaissance morale, pp.123-142; Maritain: Science et Sagasse. pp.278-288).

....

SCHEMATIC SUMMARY.

510. SCHEMATIC RECAPITULATION: What has been said in the fore-going chapter may be thus schematically summarized:-

Sociology
- Its OBJECT: social facts, which
  - Are not (as says Durkheim)
    - Psychic.
    - Proceeding from collective consciousness.
    - Coercive only.
  - But are
    - Moral.
    - Proceeding from human activity for the procuring of a common good.
    - Imposing moral obligations.
- T
  - IT IS NOT a speculative science
    - To which normative moral science ought to give place (as says Durkheim).
    - Distinct from normative moral science (as says Delos).
  - Separated from all teleological (normative) deration it is only a science improp- y so-called (matter of experimental on).
  - re:
    - But continued by moral philosophy, it is true science annexed to moral philosophy:
      - It cannot perfectly abstract from normative judgments,
      - But as far as is possible, it keeps them implicit and virtual.

……

CHAPTER FORTY-FOUR.

……

HISTORY.

……

511. ORDER OF PROCEDURE: This consideration of history:

A. Will deal:
a. First, with the nature of history.
b. Secondly, with the method of history.

B. Hence the following order:-

On history
- Its nature....................................Article one.
- Its method....................................Article two.

……

ARTICLE ONE.

NATURE OF HISTORY.

512. NOTION AND IMPORTANCE OF HISTORY: Under the name:

A. HISTORY is meant the DISCIPLINE WHICH BY SCIENTIFIC METHODS STUDIES HUMAN EVENTS.

B. The importance of this discipline is manifest: for by it we know the past which is of the highest interest to us:

a. First indeed, SPECULATIVELY: for since man naturally desires to know all things, the knowledge of the past is not without intellectual satisfaction.

b. But secondly, PRACTICALLY:
b1. For by knowledge of the past many present events and facts are explained: for present things have been influenced by past things.
b2. Moreover, history by its examples, is a "teacher of life".

C. In modern times:
a. history has made much progress:
a1. on account of greater perfection of methods (the employment of which has been rendered much easier and more efficacious through modern devices, such as printing, photography, more rapid transport etc);
a2. and on account of a better conception of this discipline.
b. Accordingly something will be said about each, to wit:
b1. about the nature of history,
b2. and about its method.

513. WHETHER HISTORY IS SCIENCE: Regarding the nature of history there is controversy: for not all are agreed that history is genuine science.

A. For science is certain knowledge through causes (cf. n.386): but on two heads history seems to default from the notion of science:
a. First, as regards certitude: for certitude is only about necessaries:
a1. but human events are singular,
a2. and therefore contingent.
b. Secondly, as regards manner of knowing:
b1. For history is not knowledge through causes: it does not establish laws;
b2. In brief;
b2a. it does not explain facts,
b2b. but only describes them.

B. Notwithstanding this, some authors admit that history truly is science, not indeed in the "Aristotelic" sense, according to which science is of universals alone, but inasmuch as:
a. Though history is about contingent facts, nevertheless it can prove their existence with certitude.
b. It can moreover investigate the causes of events, and therefore explain them.
c. Lastly, it uses scientific methods.

C. And rightly indeed is this asserted, namely, that history is science, not indeed in the "Aristotelic" sense or simply speaking, but in a qualified sense (secundum quid):

a. For:
a1. The liberty of men is no obstacle to the proving, with certitude, of the existence of human events, since it is question:
a1a. either of proving the existence of past events: to which the question of whether they were free or not is indifferent;
a1b. or of investigating the causes of a free act: for these can be determined at least conjecturally: which is very often the case also in the physical sciences.

a2. And therefore that history is science, is admitted:

a2a. Not only by *Hegelians* and *Positivists* (v.g. *Hegel*, *Taine*, *Marx*, *Herder*, *Vico*, and the *'Sociological School'*), who deny free-will;

a2b. But also by many others, such as Pesch (Logica, n.743), *Geny* (Critica, pp.362ss), *Palhories* (La Philosophie au Baccalaureat, p.184), *Boyer* (Cursus Philos. I, pp.294ss), who affirm free-will.

b. Nevertheless *it is to be noted* that the certitude of history is of *another species* than *physical* or *metaphysical* certitude; nor ought history seek a certitude whereof it is incapable.

b1. The certitude of history:

b1a. pertains to *moral* certitude, which is true "as in most cases",

b1b. and is based on evidence of credibility, or of a thing testified.

b2. Most often, in history, is obtained a certitude arising from a convergence of probabilities or of indications: such certitude is indeed true certitude, for it arises:

b2a. not from addition of probabilities,

b2b. but from this, that a certain fact appears as the only reason explaining the concordance of all the facts.

514. HISTORY PERTAINS TO THE GENUS OF PRACTICAL SCIENCE: *To which genus of science history pertains*, is easily determined after what has been said above (nn.505-510) regarding sociology, and which *'a fortiori'* avail of history.

A. From this, that history is about moral facts, it is clear that history is to be reduced:

a. not to speculative knowledge.

b. but to practical knowledge.

B. Therefore, that history is not a true science unless it is *in continuity* with moral philosophy is likewise clear, since it is:

a. *science of simple information*,

b. *not explicitly normative*.

C. For which reason:

a. since history still less than sociology can abstract from circumstances of time and place (cf. n.506, C.b),

b. still more than sociology ought it 'per se':

b1. abstain from *explicit* normative judgments,

b2. and leave *these judgments* to philosophy of history:

b2a. which is connected with history,

b2b. and to which it pertains to determine historical laws.

……

ARTICLE TWO.

METHOD OF HISTORY.

515. END OF THE METHOD OF HISTORY: The method of history is ordered towards this:

A. That facts be known with certitude: historical method as ordered towards this, will be considered first (n.516).

B. That right use be made of these facts by the historian to construct history: historical method as ordered towards this will next be dealt with (n.517).

516. SCIENTIFIC DETERMINATION OF FACTS: For the determination of facts, two tasks must be performed, to wit, that of *HEURISTICS*, and that of *HISTORICAL CRITICISM*.

A. HEURISTICS is ordered towards the finding of past facts in written documents, in monuments, and in oral traditions.

a. Monuments (v.g. pictures, buildings, clothes, weapons, coins, medals, seals, tools, statues) supply material testimonies.

b. Documents (v.g. annals, chronicles, deeds, judiciary verdicts, inscriptions, official or private papers, literary works) supply rather psychological testimonies.
b1. These are found for the most part in libraries, archives, museums etc.
b2. With respect to these, certain auxiliary sciences are employed, v.g. epigraphy, paleography etc.

c. Oral traditions:
c1. are not indeed to be despised or spurned, as some writers contend;
c2. but the historian ought to use them with caution.

B. Facts, when found, must be subjected to HISTORICAL CRITICISM, which is ordered to the determining of the authenticity, integrity, interpretation and value of the facts.

a. As regards the AUTHENTICITY:

a1. Of oral traditions: Authenticity is determined by diverse signs, such as:
a1a. Nearness to the time of the fact,
a1b. The impossibility of a later origin of the tradition,
a1c. The importance of the fact,
a1d. The publicity or manifestness of the fact,
a1e. The facility of explaining the absence of some testimony (v.g. from the law of the 'arcanum', the destruction of books, etc),
a1f. The presence of some traces.

a2. Of documents and monuments: Authenticity is determined from certain signs, which may be either external to the document or monument or internal to it:
a2a. External signs are such as:
a2a1. the name of the author, especially in more ancient codices;
a2a2. quotations made by writers of the same period;
a2a3. the assigning of the document or monument by writers of the same period to such an author.
a2b. Internal signs are such as:
a2b1. language, style, or hand-writing, customary to a given author or period;
a2b2. facts, customs, arts etc. described in the document, agreeing with the period;
a2b3. opinions coherent with the minds or doctrines of an author.

b. As regards the INTEGRITY (of documents): That the text is had without interpolation, or suppression of some part, or corruption, is determined by almost the same signs as authenticity.

c. As regards the INTERPRETATION, attention must be paid:
c1. To the language, abbreviations, style of the author, events assigned to the time of the document.
c2. To the literary style of the writing, according to the diverse manner of writing history at diverse periods and in diverse regions.
c3. To the evolution of the meaning of words.

d. But to determine the VALUE OF THE FACTS, two things must be examined, to wit, the knowledge and the veracity of the author (or witness):

d1. As to the knowledge of the author or witness:
d1a. Two things are to be examined:
d1a1. His intellectual fitness to have knowledge: and this indeed:
d1a1a. whether it be, for ordinary facts, a normal use of the senses and of reason,
d1a1b. or, if it be question of some speciality, a scientific habit about such subject (yet this is more necessary when it is question of the

interpretation of fact than when it is question of the perception of a fact).

dla2. His moral fitness to have knowledge: which requires his freedom from passion, prejudice, credulity, etc.

dlb. The knowledge of an author or witness will appear:

dlb1. from the concordant testimony of authors, if there be many who agree thereupon;

dlb2. from a narration descending down to minute details, making it clear that the author is conversant with the subject.

d2. As to the truthfulness of the author or witness, these questions are to be examined:

d2a. Whether before or after his testimony he always preferred uprightness to his own interest?

d2b. Whether:

d2b1. he had some interest in deceiving (v.g. avarice, ambition, loyalty to a party, hatred of another, desire to justify his own opinion, desire for adulation, prejudices, desire for a striking effect, etc),

d2b2. or gave his testimony against his own interest (v.g. at the risk of his fortune or of his reputation or of his liberty)?

d2c. Whether several, speaking of the same fact, are concordant or not? (Here care is to be taken not to be deceived by a merely apparent disagreement).

d2d. Whether the author or witness narrated the fact publicly, yet no one contradicting his assertion, at a time and place in which many must have known the truth?

517. CONSTRUCTION OF HISTORY: The scientific determination of facts is only the preliminary stage of history.

A. Therefore after the determination of the facts has been made, the construction of the history is to be instituted:

a. First, all the facts must be reconstructed, by the use chiefly of reasoning from analogy (cf. n.313).

b. Secondly, the facts must be ordered:

b1. either according to conditions extrinsic to the facts themselves (v.g. of time, place, society, nation, etc),

b2. Or according to resemblances of the facts themselves, and then with special attention to the influence of facts.

c. Thirdly, the facts are divided in natural and homogeneous periods of time.

d. Fourthly, the omissions and 'lacunae' of documents must be supplied:

d1. which is done chiefly by use of reasoning from analogy,

d2. which however must be used with caution.

e. Fifthly:

e1. A selection is to be made of the facts which are to be introduced into the narrative, together with apt, full and concise formulas or modes of expression, so that the history will be, like every science, a certain economy.

e2. This narrative:

e2a. which cannot be purely objective, i.e. without any judgment of moral value, by reason of the nature of history,

e2b. nevertheless ought, as said above (n.514), abstract, as far as possible, from these judgments. (Cf. De Smedt: Principes de la critique historique; Langlois et Seignobos: Introduction aux etudes historiques; Benigni: Historiae Ecclesiasticae Propaedeuctica; Geny: Critica, pp.362-380).

B. From history, properly so-called, as regards construction, differ monographs, which are treatments of very restricted questions or parts of history.

a. These monographs ought to be, as far as possible, exhaustive.

b. They are rather preparation for history than history properly so-called, and therefore are of great usefulness.

……………………………………

SCHEMATIC SUMMARY.

518. SCHEMATIC RECAPITULATION: What has been said regarding history in the fore-going chapter may be thus schematically summarized:-

- History
  - IN ITSELF
    - Its importance
      - Speculatively: it gives satisfaction to the intellect.
      - Practically
        - The past often explains the present.
        - It is a "teacher of life".
    - What it is:
      - Its definition: Discipline regarding human events.
      - Its NATURE
        - It is NOT science simply speaking
          - Because it is about singulars.
          - Because it is chiefly descriptive:
        - NEVERTHELESS
          - It is science insofar as
            - It can prove the existence of facts with certitude.
            - It explains facts insofar as it unfolds their causes.
          - It is practical science
            - Not independent.
            - But as continued by moral philosophy.
  - IN ITS METHOD
    - Determination of facts:
      - HEURISTICS: investigation of facts.
      - HISTORICAL CRITICISM, whereby is determined regarding documents:
        - Their AUTHENTICITY.
        - Their INTEGRITY.
        - Their INTERPRETATION.
        - Their VALUE, by examining the author's or witness'
          - Knowledge.
          - Veracity.
    - Construction of history:
      - Reconstruction of the facts.
      - Coordination of the facts.
      - Division of facts into periods.
      - Supplying of omissions.
      - Selection of facts and apt formulas of exposition.

……

APPENDICES TO LOGIC

APPENDIX 1.

INSERTION AFTER PARAGRAPH 11.

11. bis. ILLUSTRATION OF THE OBJECT OF LOGIC: Accordingly, the above doctrine of the formal object of logic may be illustrated from the formal object of the science of ARCHITECTURE.

A. For ARCHITECTURE is the science of the order or DESIGN of buildings.

a. Let us suppose that a builder in Italy builds a building according to a certain design, and that a photograph is taken of that building. Then we have:

a1. The BUILDER . . . . i.e. the AGENT,
a2. His BUILDING . . . . i.e. his ACT,
a3. the BUILDING built . . . . i.e. his WORK or PRODUCT
a4. the DESIGN of this building . . . . i.e. the ORDER of the work.
a5. the PHOTOGRAPH . . . . i.e. the SIGN of the work.

b. Now let us suppose that an architect in Australia wishes to study the design of that building situated in Italy. Now this architect:

b1. Is not primarily and essentially concerned with the BUILDER, for architecture is not the science of builders, - though he may be concerned in some manner with the builder, forasmuch as certain abilities are required in a builder to build a building of such design.

b2. Nor is he primarily and essentially concerned with the ACTS of the builder (his building), for architecture is not the science of these acts, i.e. of building as it is an activity, - though he may be concerned in some manner with these acts for a reason similar to that on account of which he is concerned with the builder.

b3. Nor is he primarily and essentially concerned even with the BUILDING (the work or product of the builder), for architecture is not the science of buildings, - though he will be much concerned with the building as it is the matter or subject wherein the design is realised; but then for an understanding of the design.

b4. But he is primarily and essentially concerned with the DESIGN or order of the building, for architecture is the science of the design of buildings. And he is concerned with other things forasmuch as they are related to the design of the building as conducing to an understanding of such design.

b5. Nor is he primarily and essentially concerned with the PHOTOGRAPH or sign of the building, for architecture is not the science of photographs, - though he will be much concerned with the photograph, which he can have and examine, forasmuch as it leads him to an understanding of the design of the building, which, since it is absent from him, he cannot examine immediately.

c. Accordingly, the formal object of architecture may be thus schematically illustrated:-

APPENDICES TO LOGIC

APPENDIX 1.

INSERTION AFTER PARAGRAPH 11.

11. bis. ILLUSTRATION OF THE OBJECT OF LOGIC: Accordingly, the above doctrine of the formal object of logic may be illustrated from the formal object of the science of ARCHITECTURE.

A. For ARCHITECTURE is the science of the order or DESIGN of buildings.

a. Let us suppose that a builder in Italy builds a building according to a certain design, and that a photograph is taken of that building. Then we have:

a1. The BUILDER . . . . i.e. the AGENT,
a2. His BUILDING . . . . i.e. his ACT,
a3. the BUILDING built . . . . i.e. his WORK or PRODUCT
a4. the DESIGN of this building . . . . i.e. the ORDER of the work.
a5. the PHOTOGRAPH . . . . i.e. the SIGN of the work.

b. Now let us suppose that an architect in Australia wishes to study the design of that building situated in Italy. Now this architect:

b1. Is not primarily and essentially concerned with the BUILDER, for architecture is not the science of builders, - though he may be concerned in some manner with the builder, forasmuch as certain abilities are required in a builder to build a building of such design.

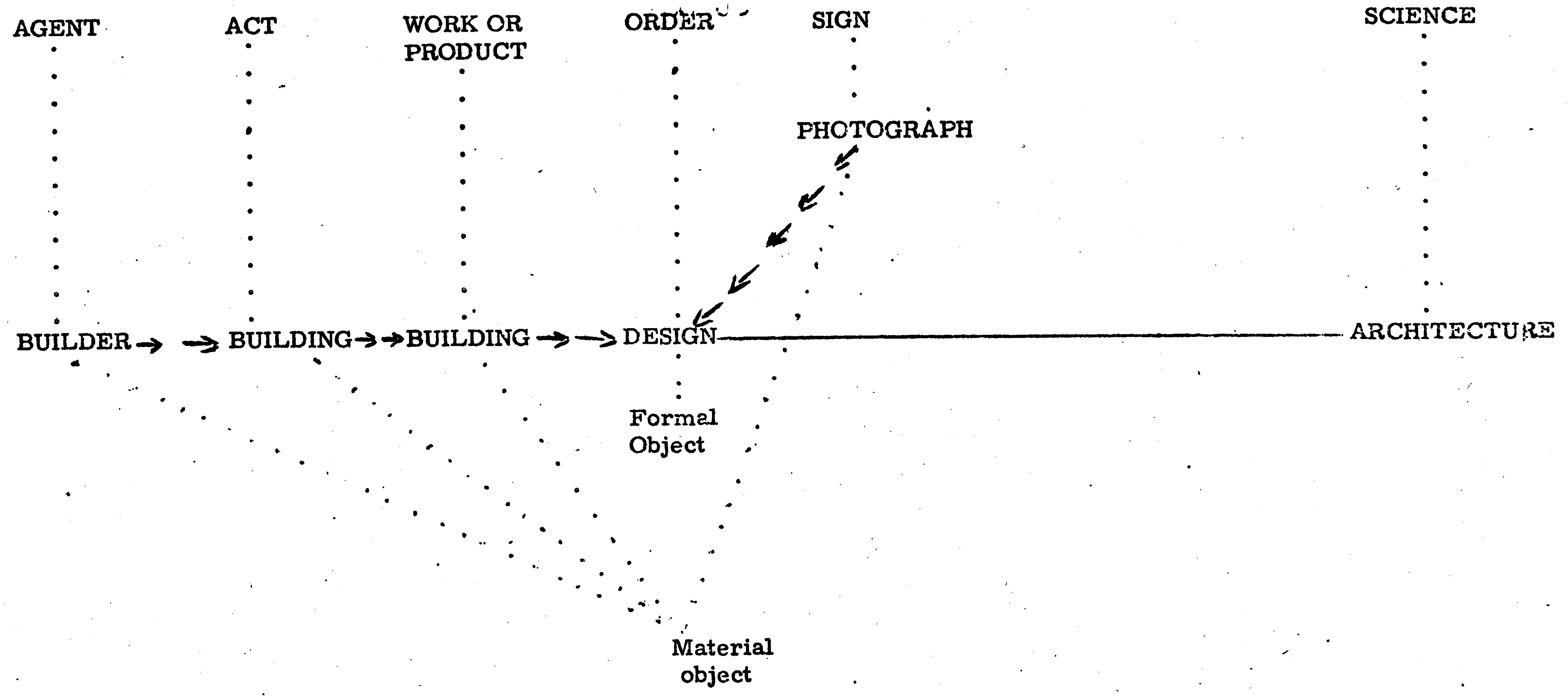
b2. Nor is he primarily and essentially concerned with the ACTS of the builder (his building), for architecture is not the science of these acts, i.e. of building as it is an activity, - though he may be concerned in some manner with these acts for a reason similar to that on account of which he is concerned with the builder.

b3. Nor is he primarily and essentially concerned even with the BUILDING (the work or product of the builder), for architecture is not the science of buildings, - though he will be much concerned with the building as it is the matter or subject wherein the design is realised; but then for an understanding of the design.

b4. But he is primarily and essentially concerned with the DESIGN or order of the building, for architecture is the science of the design of buildings. And he is concerned with other things forasmuch as they are related to the design of the building as conducing to an understanding of such design.

b5. Nor is he primarily and essentially concerned with the PHOTOGRAPH or sign of the building, for architecture is not the science of photographs, - though he will be much concerned with the photograph, which he can have and examine, forasmuch as it leads him to an understanding of the design of the building, which, since it is absent from him, he cannot examine immediately.

c. Accordingly, the formal object of architecture may be thus schematically illustrated:-


AGENT
ACT
WORK OR PRODUCT
ORDER
SIGN
SCIENCE
PHOTOGRAPH
BUILDER
BUILDING
BUILDING
DESIGN
ARCHITECTURE
Formal Object
Material object

B. Now LOGIC is the science of the ORDER or design of the work or product of the intellect.

a. But that which the intellect orders or designs is its concepts, - which is acquires FROM THINGS, by a first act which is accordingly named FIRST INTENTION.

b. But it is by a second act, which accordingly is named SECOND INTENTION, that the intellect orders or designs that which it has acquired from things (i.e. its concepts), endowing these concepts with mental relations, that is, with the order of design.

c. Therefore, when it is question of the object of logic, there are to be distinguished:

c1. the INTELLECT . . . . i.e. AGENT,
c2. its ACTS as ordering its concepts . . . . i.e. ACT,
c3. its ordered WORK or product . . . . i.e. WORK,
c4. the ORDER of this work . . . . i.e. ORDER,
c5. SPEECH expressing its ordered work . . . . . . i.e. SIGN.

d. Now the logician:

d1. Is not primarily and essentially concerned with the INTELLECT, for logic is not the science of intellect (the science of human intellect is psychology), - though he is concerned with the intellect forasmuch as it is the orderer required for the order in its products.

d2. Nor is he primarily and essentially concerned with the ACTS of the intellect, for logic is not the science of the acts of the intellect (the science of the acts of human intellect is psychology), - though he is concerned with these acts forasmuch as they are the productions of the order in the products of the intellect.

d3. Nor is he primarily and essentially concerned with the WORKS or products of the intellect, for logic is not the science of the products of the intellect (the science of the products of the human intellect is psychology), - though he is concerned with these products as the matter or subject wherein the order is constituted; but then for an understanding of this order.

d4. But he is primarily and essentially concerned with the ORDER with which the intellect endows its concepts in its products, for logic is the science of this order. And he is concerned with other things forasmuch as they are related to this order as conducing to understanding of it.

d5. Nor is he primarily and essentially concerned with SPEECH or the sign of the products of the intellect, for logic is not the science of speech (the science of speech as it is an act is psychology, while the science of speech as it is a syntactically ordered product is grammar), - though he is much concerned with speech (terms, propositions and argumentations) which is sensible and, therefore, easily examined, forasmuch as it leads him to understanding of the order or design of the products of the intellect which are not sensible and, therefore, are not so easily examined.

e. Now, let it be understood for clarity, that there are three genera of ACTS OF SECOND INTENTION WHEREBY THE INTELLECT ORDERS its concepts (that is, orders what it acquired by its first intention from things), - which genera of acts are SIMPLE APPREHENSION, JUDGMENT and REASONING.

e1. Of SIMPLE APPREHENSION:

e1a. the product or work is the UNIVERSAL CONCEPT,

e1b. while the order or design whereby the concept is ordered in that work is PREDICABILITY,

e1c. while the sign of that work is the TERM (or word)

e2. But of JUDGMENT:

e2a. the product or work is the ENUNCIATION,

e2b. while the order or design whereby concepts are ordered in this work is PREDICATION,

e2c. while the sign of this work is the PROPOSITION (or sentence).

e3. While of REASONING:

e3a. the product or work is (also called) REASONING,

e3b. while the order or design whereby concepts are ordered in this work is ILLATION.

e3c. while the sign is ARGUMENTATION

C. For the understanding of the ORDER or design constituted by the intellect through its acts of second intention in its concepts, let us suppose that my intellect has drawn into itself from things these five natures or "blocks of reality", to wit, "man", "idiot", "poet", "wise" and "mortal". (The act of intellect imbibing into itself these blocks of reality or natures is called the act of FIRST INTENTION, and these natures existing in the intellect are REAL BEING, i.e. blocks of REALITY).

a. Let us suppose that my intellect got the block of reality "man" from Peter and Paul and Mary and Agnes. Thus Peter and Paul and Mary and Agnes have themselves as TERM WHEREFROM this block of reality was got or abstracted.

a1. Then my intellect reflects on this block of reality "man", and sees or apprehends it as predicable of (i.e. sayable of) Peter and of Paul and of Mary and of Agnes, and also of Henry and of John and of Joan and of Ruth etc., or even of some subject or subjects not yet known determinately.

a2. Now:

a2a. this block of reality stands in my intellect as RELATED TOWARDS Peter and Paul and Mary and Agnes and Henry etc.;

a2b. and these individuals have themselves to it as TERM WHEREUNTO it is related;

a2c. and the relation whereby "man" is related to these individuals is PREDICABILITY.

a3. Thus now "man" stands in my intellect as ORDERED or DESIGNED for predication, i.e. though it is not yet an actual predicate, it is already APT TO BE A PREDICATE.

a4. The act whereby my intellect thus endowed the block of reality "man" with this ORDER or DESIGN or APTITUDE for predication, is an act of SECOND INTENTION (of simple apprehension), i.e. it is not an act whereby intellect GETS SOMETHING FROM REALITY (such an act would be first intention), but it is an act whereby intellect ORDERS WITHIN THE INTELLECT ITSELF WHAT IT HAS GOT FROM REALITY.

b. Now let us suppose that my intellect goes further and pronounces the verdict "Peter is a man".

b1. Now:

b1a. this block of reality "man" stands in my intellect not merely as APT TO BE PREDICATED of something, but as ACTUALLY PREDICATED, - that is, it now has in my intellect a NEW RELATION to Peter;

b1b. and Peter has himself towards "man" as IN A NEW MANNER a TERM WHEREUNTO "man" is related;

b1c. and this new relation whereby "man" is now related to Peter is called PREDICATION.

b2. Thus "man" now stands in my intellect as ORDERED or DESIGNED or "ARCHITECTURED" by predication INTO A NEW COMPOUND UNIT which is called an ENUNCIATION or mental proposition.

b3. The act whereby my intellect thus endowed the block of reality "man" with this ORDER or DESIGN or PREDICATION is an act of SECOND INTENTION (of judgment), i.e. it is an act whereby intellect ORDERS WITHIN THE INTELLECT ITSELF WHAT IT HAS GOT FROM REALITY.

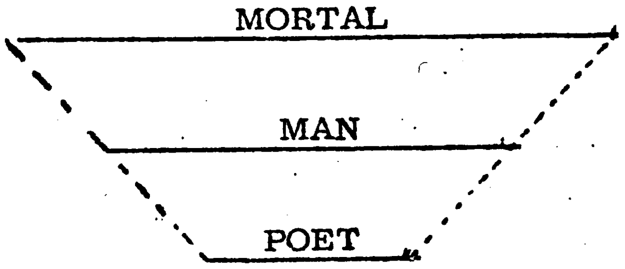
c. Now there is still another manner wherein my intellect may ORDER or "ARCHITECTURE" its concepts (i.e. what it has got from reality).

c1. Thus my intellect:

c1a. may order or "architecture" concepts thus:

" (Every) Man is MORTAL
But (every) POET is a MAN.
Therefore (every) POET is MORTAL."

c1b. Which order or "architecture" may be thus represented:-



c1c. That is, given that "man" is subjected to the predicate "mortal", and that "poet" is subjected to the predicate "man", then "poet" is subjected to the predicate "mortal".

c1d. Now:

c1d1. this block of reality "man" stands in my intellect designed or ordered or "architectured" as a MEDIUM wherewith "mortal" and "poet" are compared,

c1d2. and these other two blocks of reality, to wit, "mortal" and "poet", stand in my intellect as COMPARED EXTREMES (i.e. as MINOR TERM or SUBJECT and MAJOR TERM or PREDICATE);

c1d3. and the new relation or ORDER or DESIGN or "ARCHITECTURE" with which these blocks of reality are now endowed is called ILLATION.

c1e. Thus these "blocks of reality" or natures or concepts are now ordered together or "architectured" into a unit which is called REASONING.

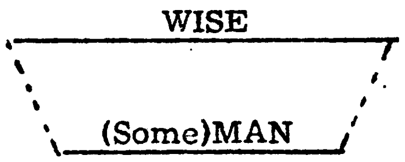
c1f. And the act whereby my intellect thus endowed these concepts or "blocks of reality" with this ORDER or DESIGN or "ARCHITECTURE" is an act of SECOND INTENTION (of reasoning), i.e. it is an act whereby intellect ORDERS WITHIN THE INTELLECT ITSELF WHAT IT HAS GOT FROM REALITY.

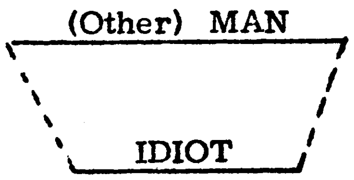
c2. For a clearer exemplification of this, let us consider a bad ordering or "architecture" of concepts or "blocks of reality":

c2a. in this bad reasoning:

"Some MAN is WISE.
But an IDIOT is a MAN
Therefore an IDIOT is WISE."

c2b. Which may be represented thus:



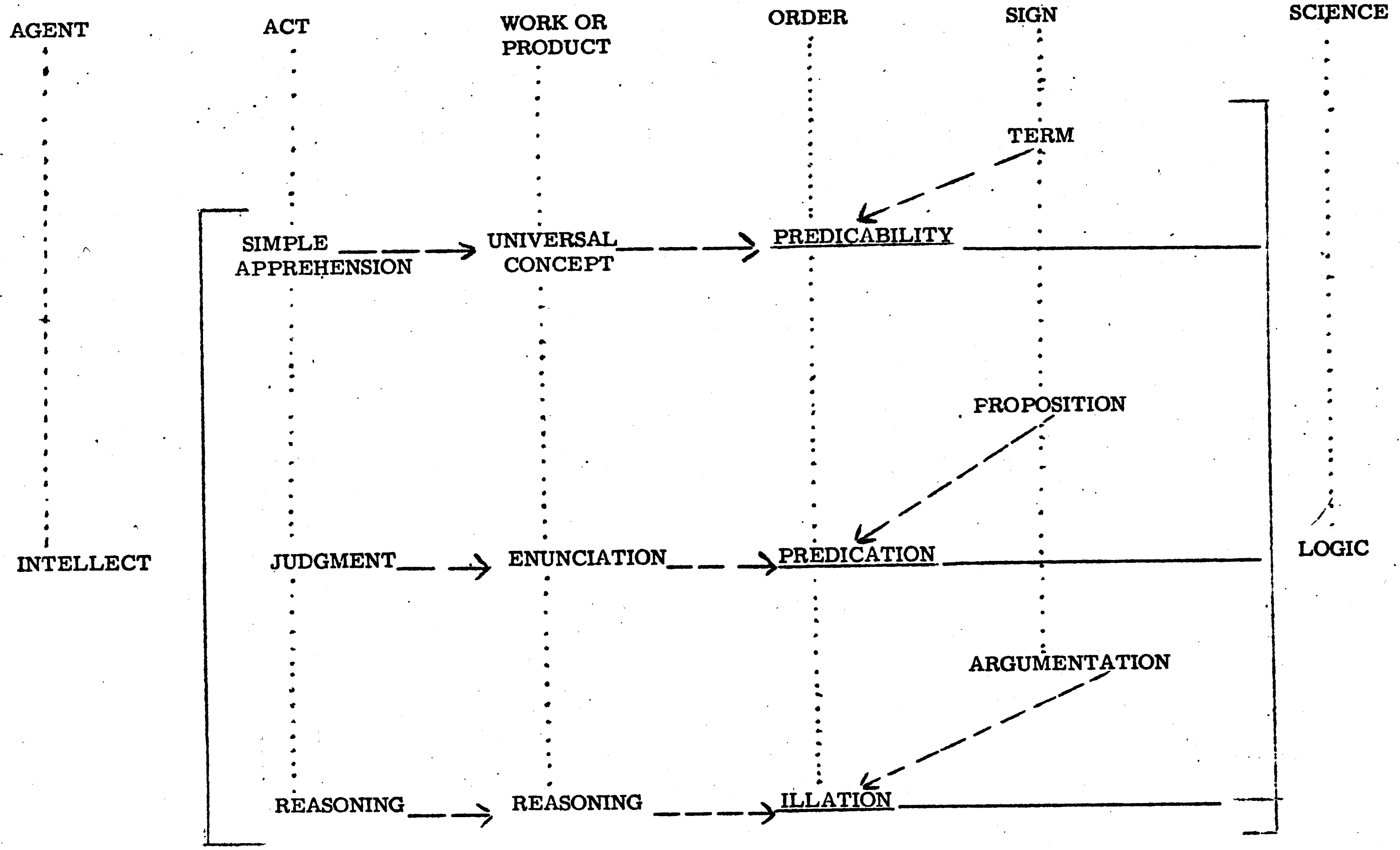


D. Accordingly:

a. The formal object of logic is the ORDER or "ARCHITECTURE" or DESIGN which the intellect makes, by its acts of SECOND INTENTION, in the natures or "blocks of reality" or concepts which by its acts of first intention it drew into itself from things - which order is indeed MENTAL BEING, to wit, MENTAL RELATION.

b. And which order or mental relation is indeed threefold, to wit,
b1. PREDICABILITY,
b2. PREDICATION,
b3. and ILLATION.

E. Therefore, the formal object of logic may be illustrated by the following schematic representation:-


AGENT
ACT
WORK OR PRODUCT
ORDER
SIGN
SCIENCE
TERM
SIMPLE APPREHENSION
UNIVERSAL CONCEPT
PREDICABILITY
PROPOSITION
INTELLECT
JUDGMENT
ENUNCIATION
PREDICATION
LOGIC
ARGUMENTATION
REASONING
REASONING
ILLATION